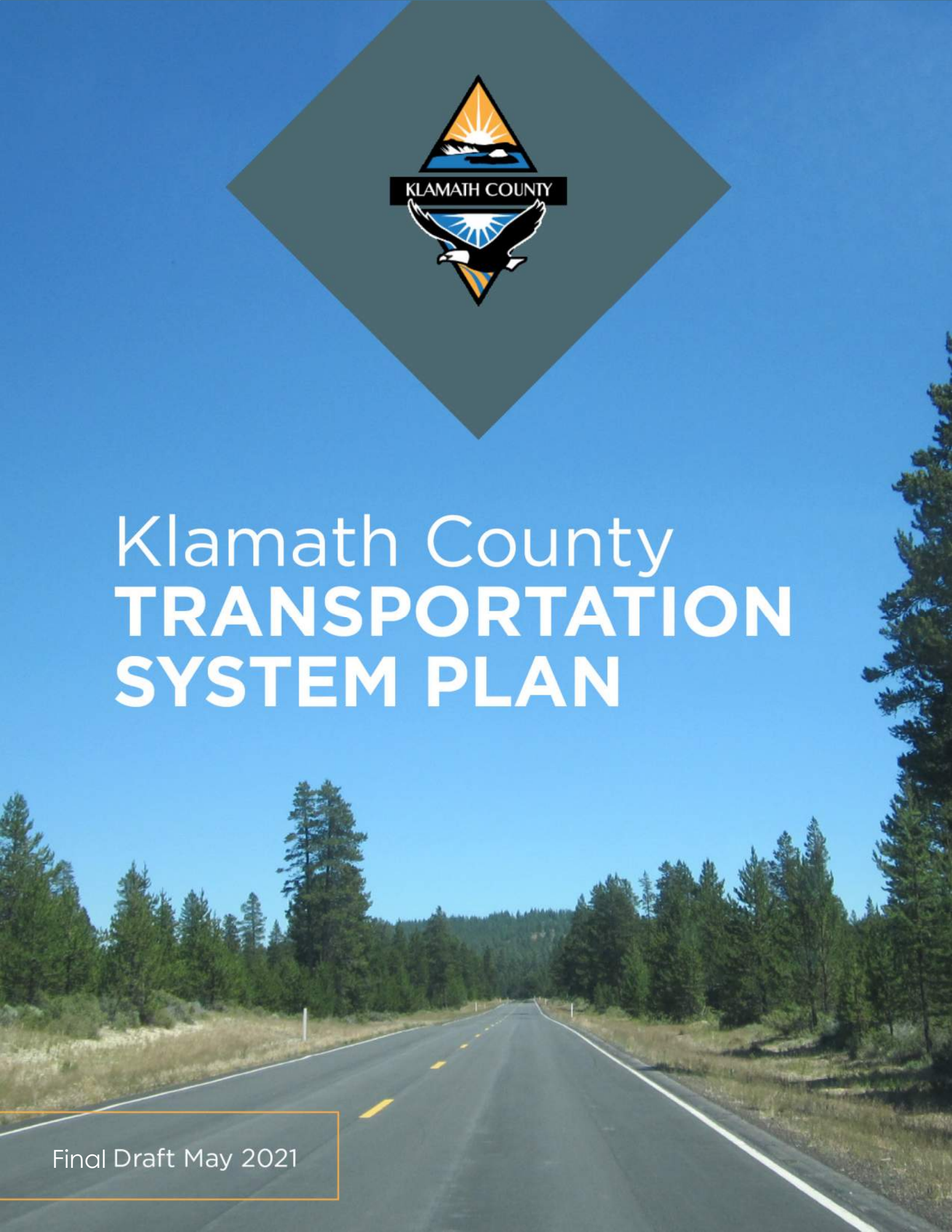

Klamath County
TRANSPORTATION SYSTEM PLAN

Final Draft May 2021

ACKNOWLEDGMENTS

The development of this plan was guided by the Project Management Team (PMT) and Project Advisory Committee (PAC). This page acknowledges the committee members who devoted their time and effort, which was instrumental in updating the Klamath County Transportation System Plan (TSP).

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- **Board of Commissioner Representative** – Derrick DeGroot
- **County Health Department Representative** – Jennifer Little
- **County Emergency Services Representative** – Brandon Fowler
- **County Parks** – Tom Crist
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- **City of Klamath Falls Public Works Representative** – Mark Willrett
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CHAPTER 1

INTRODUCTION

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1. INTRODUCTION

Welcome to the Klamath County Transportation System Plan (TSP). The County's transportation system supports how people and goods move from one place to another and affects nearly every aspect of daily life. Roadways, freight, pedestrian, bicycle, and transit facilities, rail lines, pipelines, and air transportation create the system around which the County is built and accessed and helps define its livability. The transportation system is the backbone that supports the County as it continues to grow and accommodate new citizens. This plan should remain relevant and responsive and will be revisited over time. In this chapter, a brief overview of the planning context for the TSP is provided including its background information, study area, update process, public engagement, and organization.

The County's transportation system supports how people and goods move from one place to another and affects nearly every aspect of daily life.

BACKGROUND

The Klamath County TSP identifies the transportation facilities and services to support the County's adopted Comprehensive Plan. It establishes the County's goals, policies, and action strategies for developing its transportation system through the year 2040. It describes on-going roadway maintenance needs as well as identifies improvements that can enhance roadway safety and connectivity, non-motorized travel (bicycles and pedestrians), freight traffic, and public transit service, and support future land development activity throughout the County, including unincorporated areas.

The TSP is intended to guide transportation decisions that support the County's needs and visions, ensure an economically vital, healthy, and equitable region, and conforms to state and regional policies. It also serves as a tool for coordination with regional and local agencies and governments. The TSP

satisfies the state's requirements for a local transportation system plan as prescribed by Oregon Statewide Planning Goal 12: Transportation.

The Oregon Revised Statutes require that the TSP be based on the Comprehensive Plan land uses and provide for a transportation system that accommodates the expected growth in population and employment. Development of this TSP was guided by Oregon Revised Statute (ORS) 197.712 and the Department of Land Conservation and Development (DLCD) administrative rule known as the Transportation Planning Rule (TPR, OAR 660-012-0060).

Per the TPR, this TSP identifies multimodal transportation needs for users of all ages, abilities, and incomes. As such, solutions to address existing and future transportation needs for people walking, biking, rolling, taking transit, and driving motor vehicles are included. Further, one of the implementation steps of the TSP will include adoption of amendments to the Land Development Code needed to protect and provide multimodal transportation facilities. Finally, as required by the TPR, this TSP was developed in coordination with local, regional, and state transportation plans.

STUDY AREA

The TSP is primarily rural in nature and serves all regions of the County outside of the Klamath Falls, Chiloquin, Merrill, and Malin Urban Growth Boundaries (UGB's).

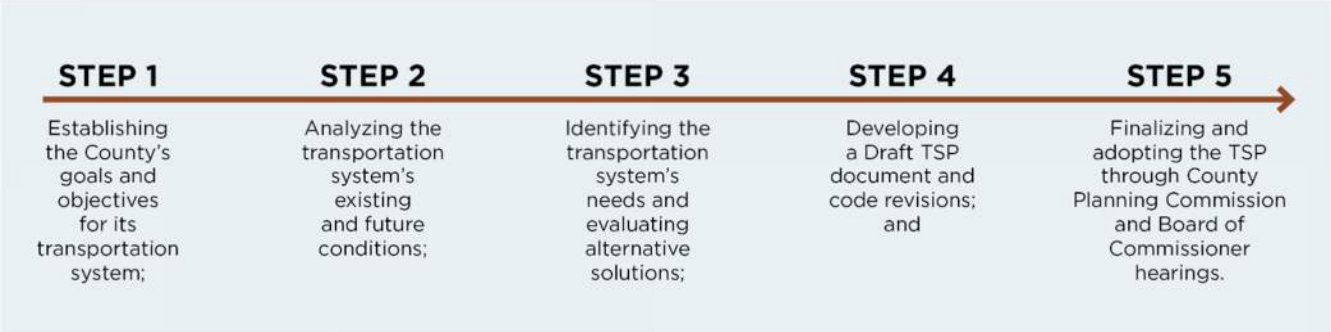
The Klamath Falls Urban Area TSP addresses County facilities within the Klamath Falls UGB. While facilities within this area are not part of the Klamath County TSP, they were considered in the County's Funding Plan (Chapter 5) of this TSP.

The Klamath County TSP study area is illustrated in Figure 1-1 at the end of this chapter. The study area reflects the transportation system that best serves the needs of residents and travelers within the rural regions of the county.

TSP PROCESS

The purpose of the 2021 TSP Update is to address growth within Klamath County, reflect updated needs and priorities, and address regulatory changes that have occurred since the previous TSP was adopted in 2010. The 2021 Update addresses compliance with new or amended federal, state, and local plans, policies, and regulations including the Oregon Transportation Plan (OTP), the state's Transportation Planning Rule (TPR), the Oregon Highway Plan (OHP), and presents the investments and priorities for people walking, biking, rolling, taking transit, and driving, and other transportation system users.

The TSP Update development process consisted of 5 fundamental steps:



Live Virtual Open House #1, archived at http://klamathcountytsp.com/websites/64/pages/365

PUBLIC ENGAGEMENT

The process for preparing the Klamath County TSP must incorporate local citizen participation and be coordinated with local transportation service providers and federal, state, and local agencies. This requirement was satisfied through a comprehensive process including the following components:

- Project website that included all technical reports, draft goals and policies, and meeting summaries;
- Project Management Team meetings attended by County and ODOT staff;
- Four Project Advisory Committee Meetings;
- Two Virtual Public Open Houses;
- Briefings with ODOT, County, and City of Klamath Falls staff regarding coordination with the Klamath Falls Urban Area TSP; and
- Updates, work sessions, and public hearings with the Planning Commission and Board of County Commissioners.

The majority of meetings, materials, and public engagement were conducted via online webinars and virtual platforms due to COVID-19 impacts. Through these activities, the County provided community members with a variety of forums to identify their priorities for future transportation projects, programs, and policies.

Source: Wikimedia Commons, by Sualkdd, CC BY-SA 3.0

TSP ORGANIZATION

The Klamath County TSP is organized in two volumes. Volume 1 is the main document and includes the items that will be of interest to the broadest audience. Volume 2 contains the technical memoranda and data that enhance and support Volume 1.

VOLUME 1

Volume 1 includes the following plan chapters and appendices:

- **Chapter 1 – Introduction**
  Provides a brief overview of the planning context for the TSP
- **Chapter 2 – Goals, Policies, and Evaluation Criteria**
  Establishes the goals and objectives that express the County's long-range vision for the transportation system
- **Chapter 3 – Needs Assessment and Evaluation**
  Identifies the transportation system deficiencies and needs and outlines the process used to develop the TSP's list of planned capital improvements and transportation policies and programs
- **Chapter 4 – Modal Plans and Projects**

An overview of the recommended projects, programs, policies, and studies for the multimodal system and provision of all multimodal projects and the costs estimated for construction

- **Chapter 5 – Transportation Funding and Implementation**
  Summarizes transportation funding and implementation, including estimated revenue, cost of 20-year needs, and potential funding sources
- **Appendix 1A – Project Summary Tables and Evaluation Matrix**
  Provides a compilation of tables detailing the projects identified in the plan chapters
- **Appendix 1B – Project Cost Estimates**
  Provides detailed planning-level cost estimate sheets for the projects identified in the plan chapters
- **Appendix 1C – Urban Area Project Summary Tables**
  Provides a compilation of tables detailing the projects identified in the Klamath Falls Urban Area TSP for County facilities outside of city limits
- **Appendix 1D – Financial Scenarios**
  Provides the table detailing the assumptions in the financial scenarios presented in Chapter 5
- **Appendix 1E – Recommended Comprehensive Plan and Land Development Code Amendments**
  Provides a summary of recommended amendments to the County's Comprehensive Plan and Land Development Ordinances to support the TSP

VOLUME 2

Volume 2 includes the following technical support documents:

- **Appendix 2A:** Technical Memorandum 1: Plans & Policy Review
- **Appendix 2B:** Technical Memorandum 2: Goals, Objectives, & Evaluation Criteria
- **Appendix 2C:** Technical Memorandum 3: Existing & Future Conditions Inventory & Analysis
- **Appendix 2D:** Technical Memorandum 4: Solutions Analysis & Funding Program
- **Appendix 2E:** Technical Memorandum 5: Preferred Solutions

0 20 Miles

Study Intersections
Study Segment Count Locations
Study Segments
Parks
UGBs

*Areas within city limits (Klamath Falls, Merrill, Malin and Chiloquin) are not included in the County's TSP.

H:\24\24113 - Klamath County TSP Update\gis\DRAFT\01 Study Area.mxd - jsommerville - 1:00 PM 4/14/2021

Study Area
Klamath County, Oregon

Figure
1-1

KITTELSON & ASSOCIATES

2

CHAPTER 2

GOALS, POLICIES & EVALUATION CRITERA

2. GOALS, OBJECTIVES, & EVALUATION CRITERA

The TSP Goals are intended to be broad statements that characterize the desires and vision for the future transportation system of Klamath County. The goals are intended to be aspirational and may not be fully attained within the 20-year planning horizon of this plan. The goals are also intended to be supported by the objectives and evaluation criteria for the County to address after the TSP has been adopted.

Objectives are statements adopted to provide a consistent course of action and move the community toward attaining its goals. Objectives in the TSP guide the work of the County staff in formulating proposed changes to the Zoning Code and other regulatory documents, to guide other work programs and long-range planning projects, and to prepare budget and capital improvement programs. These objectives will not be used solely in determining whether the County shall approve or deny individual land use applications.

GOAL 1 – SAFETY

Provide a transportation system that is safe and secure for all transportation modes and for people of all abilities.

OBJECTIVES

1.1 Prioritize projects, programs, and policies that seek to reduce crash frequency and severity.

1.2 Provide emergency vehicles with sufficient access to locations throughout the County.

1.3 Develop access management standards consistent with national guidelines and state requirements to reduce and minimize conflicts between road users.

1.4 Implement safety improvements to existing roadways when roads are scheduled to undergo maintenance.

1.5 Coordinate with existing safe routes to school (SRTS) plans and identify potential transportation engineering solutions as part of future SRTS plans for local schools.

1.6 Consult the Highway Safety Manual (HSM) as part of the capital project evaluation processes and development review.

1.7 Identify opportunities to minimize the number of at rail crossings.

1.8 Enforce the County's Land Development Code to facilitate connectivity within the roadway network of new developments.

1.9 Anticipate the needs and costs of maintaining the County's infrastructure as it ages to secure funding and schedule maintenance.

GOAL 2 – ENVIRONMENT

Create a sustainable and resilient transportation system, while minimizing environmental impacts of the transportation system, improvement projects, and maintenance.

OBJECTIVES

2.1 Balance all modes of the transportation system with their environmental impacts to encourage and facilitate sustainable travel options and to improve the system's resiliency to natural hazards and weather.

2.2 Work with natural gas companies to install and maintain regional pipeline systems in locations that enhance security, local service, and efficiency.

2.3 Work with regional partners to identify and develop adoptable policies, programs, and actions pertaining to growth management, air and water quality improvement, and emissions reductions.

2.4 Avoid or minimize impacts of the transportation system to the scenic, natural and cultural resources in the county.

2.5 Consider alternative transportation facility designs in constrained areas to avoid or minimize impacts to natural resources.

2.6 Promote the use of sustainable travel modes, including public transportation, in Klamath County.

GOAL 3 – ECONOMIC DEVELOPMENT

Provide a transportation system that facilitates a thriving economy through the efficient movement of goods and easy access to economic opportunities.

OBJECTIVES

3.1 Provide access to newly developed and future land parcels that both satisfies legal requirements and contributes to transportation goals.

3.2 Identify and promote routes to freight shippers that can support freight traffic and minimizes potential conflicts with other roadway users, particularly bicyclists and pedestrians.

3.3 Incorporate the needs of freight into new roadway design and improvements to existing facilities.

3.4 Support the effective management and improvement of airport-related facilities and services.

3.5 Meet federal and state safety standards for rail operations, construction, and system maintenance.

3.6 Attract tourism and recreational development by providing a transportation system that fulfills the mobility needs of diverse users and enhances connections between tourist destinations.

3.7 Enforce compliance with development impact fees and frontage improvements required by the Land Development Code.

3.8 Provide transportation routes and promote public transportation services that connect Klamath County residents to employment, educational opportunities, and other services.

GOAL 4 – EQUITY

Maximize the benefits of a sustainable transportation system to all users by improving conditions and access for affordable mobility options, including walking, biking, taking transit, and ridesharing, and by minimizing potential negative impacts of transportation projects to communities and the environment.

OBJECTIVES

4.1 Develop and maintain a road functional classification system to provide an optimal balance between mobility and accessibility for all transportation modes.

4.2 Develop guidance for bicycle facilities on County roads that balances the need for safe bicycle facilities within right of way, width, and cost constraints.

4.3 Design new transportation facilities to safely and efficiently accommodate multiple travel modes within public right-of-way in accordance with its functional classification and cross-sections.

4.4 Plan and implement a safe, attractive, efficient, and accessible system of bicycle and pedestrian facilities.

4.5 Provide multimodal connections to close gaps in the active transportation and public transit networks.

4.6 Construct new transportation facilities to comply with the Americans with Disabilities Act (ADA), and implement ADA improvements to existing facilities when they are scheduled to undergo maintenance.

4.7 Identify appropriate bicycle, pedestrian, and transit facilities when designing new roads, particularly in more densely populated areas.

4.8 Encourage the use of active transportation facilities and public transit routes with both locals and visitors by continually maintaining and improving facilities and by providing connections to local destinations, employment and educational opportunities, and services.

GOAL 5 – COORDINATION AND OUTREACH

Maintain communication with neighboring counties, local, state, and federal governments, stakeholders, private sector partners, and community members through effective coordination and outreach.

OBJECTIVES

5.1 Coordinate roadway and highway improvement projects with local, regional, state, and federal governments to enhance mobility systems in Klamath County.

5.2 Integrate airport development with the current and planned transportation system through appropriate coordination and collaboration.

5.3 Work with relevant agencies, jurisdictions, and stakeholders to identify and coordinate enhancements to truck facilities, such as truck routes and rest areas.

5.4 Work with relevant agencies to fund transportation projects that support sustainable growth and clean air and water.

5.5 Engage stakeholders and community members in determining desired mobility improvements to provide context-sensitive facilities are built and enhanced to meet local travel needs.

5.6 Coordinate with public transportation providers to locate or improve transit stops on County roadways.

GOAL 6 – LAND USE AND TRANSPORTATION INTEGRATION

Provide a transportation network that appropriately connects local land uses and anticipates mobility needs with changes in land uses.

OBJECTIVES

6.1 Provide access for users of all modes to key locations and sites, such as local businesses and services, to enhance livability.

6.2 Enhance local quality of life by designing and routing transportation facilities that are compatible with existing and planned land uses, including key destinations and farm land.

6.3 Balance the needed road function for all modes with adjacent land uses and stakeholders through context-sensitive design.

6.4 Prioritize projects that improve pedestrian and bicycle system connectivity and safety in areas near schools.

6.5 Develop context-appropriate bicycle and pedestrian networks on County roads, particularly within more densely populated areas.

6.6 Coordinate proposed development with planned transportation projects to identify opportunities for incorporation with development related transportation impact mitigation improvements.

6.7 Require property access from roadways with the lowest functional classification, when possible.

6.8 Facilitate freight connections and services, including rail, to industrial land uses.

6.9 Establish rights-of-way and/or crossover easements that support implementation of the TSP and meet County or State access management standards when land is divided or sites are developed.

GOAL 7 – IMPLEMENTATION

Implement timely transportation improvements and maintenance projects that are feasible, provide a positive return on investment, and are adequately funded.

OBJECTIVES

7.1 Develop a project prioritization method to weigh new projects with previously identified projects and to guide project implementation. Develop an implementation matrix and update the County's Capital Improvement Plan.

7.2 Establish and provide adequate and sustainable funding to maintain the current and improve state of the transportation system.

7.3 When assessing maintenance needs, prioritize maintenance projects that will provide the greatest benefit to users' safety. For example, if two projects have equal maintenance need and paving conditions, the project that has greater safety benefit should be implemented.

7.4 Consider additional transportation revenue sources.

7.5 Identify opportunities to implement rural Intelligent Transportation System (ITS) strategies.

7.6 Partner with ODOT and other jurisdictions to develop a long-range financial strategy for transportation improvements and operational and maintenance requirements.

7.7 Review and revise where necessary local land use and development requirements to ensure that future land use decisions are consistent with the planned transportation system.

7.8 Develop a Deferred Improvement Agreement to provide a consistent yet flexible process of enforcing new developments' mitigations, such as future roadway improvements.

EVALUATION CRITERIA

A qualitative process that is based on the TSP goals was used to evaluate the policies and projects identified in this plan. Projects were evaluated based on the following seven key goals:

1. Safety
2. Environment
3. Economic Development
4. Equity
5. Coordination and Outreach
6. Land Use and Transportation Integration
7. Implementation

This evaluation process provided quantitative scores of each based on the following scale:

The qualitative comparison and quantitative scores guided and informed discussions about the tradeoffs and benefits of identified concepts and ultimately led to the selection of the TSP policies and projects. The evaluation matrix is provided in Appendix 1A.

3

CHAPTER 3

NEEDS ASSESSMENT AND EVALUATION

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3. NEEDS ASSESSMENT AND EVALUATION

The TSP goals, policies, projects, and potential implementing actions are based on data collection, technical analyses, and input received from the community, Klamath County and partner agency staff, and policymakers. This process included analysis of existing transportation conditions for all modes of travel, forecast deficiencies in the transportation system, and an evaluation of possible system changes that can meet the transportation needs for all users (including the transportation disadvantaged) and address the need for movement of goods and services to support local and regional economic development priorities. The list of recommended projects, policies, and programs was identified based on the needs analysis and a detailed review of relevant state, regional, and local plans, policies, and funding opportunities. The following sections outline the key findings from the existing and future needs analyses that helped shape the TSP's recommended transportation projects, policies, and programs.

EXISTING TRANSPORTATION SYSTEM CONDITIONS

Existing transportation needs, opportunities, and constraints reflect an inventory of the system characteristics conducted in 2020. This inventory included major transportation-related facilities and services within the study area at that time. Key roadway features, traffic conditions, crash history, bicycle and pedestrian facilities, and transit service, among other topics, were analyzed. Detailed findings of the results of the existing needs analysis are summarized in Volume 2, *Appendix C: Technical Memorandum 3: Existing & Future Conditions Inventory & Analysis.*

BASIS OF NEED ASSESSMENT

The TSP addresses the projects, policies, and programs needed to support growth in population and jobs within the County as well as the travel associated with regional and state economic growth between now and the year 2040. The identified set of recommendations reflects County policy makers' and community members' priorities to maintain existing facilities and reduce congestion, save money, improve safety, and provide health benefits without costly increases to automobile-oriented infrastructure. Over time, the County and ODOT will periodically update the TSP to respond to changing conditions and funding opportunities.

The existing land use patterns, economic development opportunities, and population and job forecasts helped inform the analysis of year 2040 needs. This information helped identify future changes to the transportation system (and the supporting policies and programs) to address deficiencies and support economic development in a manner consistent with the County's Comprehensive Plan and Zoning Map.

GROWTH IN COUNTY POPULATION

By Oregon Revised Statute (ORS)195.034, incorporated cities and counties formulate and adopt coordinated population projections. Historic population levels shown in Figure 3-1 indicate that Klamath County has had steady overall growth since 1975. Figure 3-2 shows future population forecasts through 2065 for the County and incorporated cities. An aging population largely drives the tapering growth rates – a demographic trend which is expected to contribute to diminishing natural increase (more deaths than births). Future population growth is expected to come increasingly from in-migration – people relocating from outside Klamath County. Klamath Falls, the largest city in Klamath County, contains the largest share of County population but is expected to see lower growth rates than most of the small cities and the areas outside UGBs. This expected population projection helped inform the potential growth in vehicular traffic volumes and other modes for use in understanding future needs in the County.

The areas of higher minority populations are located in the southern portion of the County, primarily near the cities of Chiloquin and Malin. In those census block groups, a significant portion of the population is in a classified minority group, ranging from 40 percent to 53 percent. East of Klamath Falls, block groups have notable minority populations consisting of 15 percent to 39 percent of the population.

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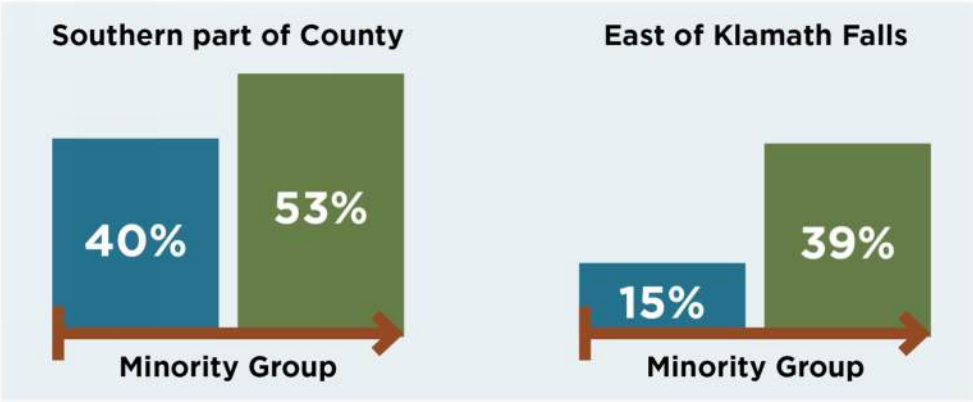


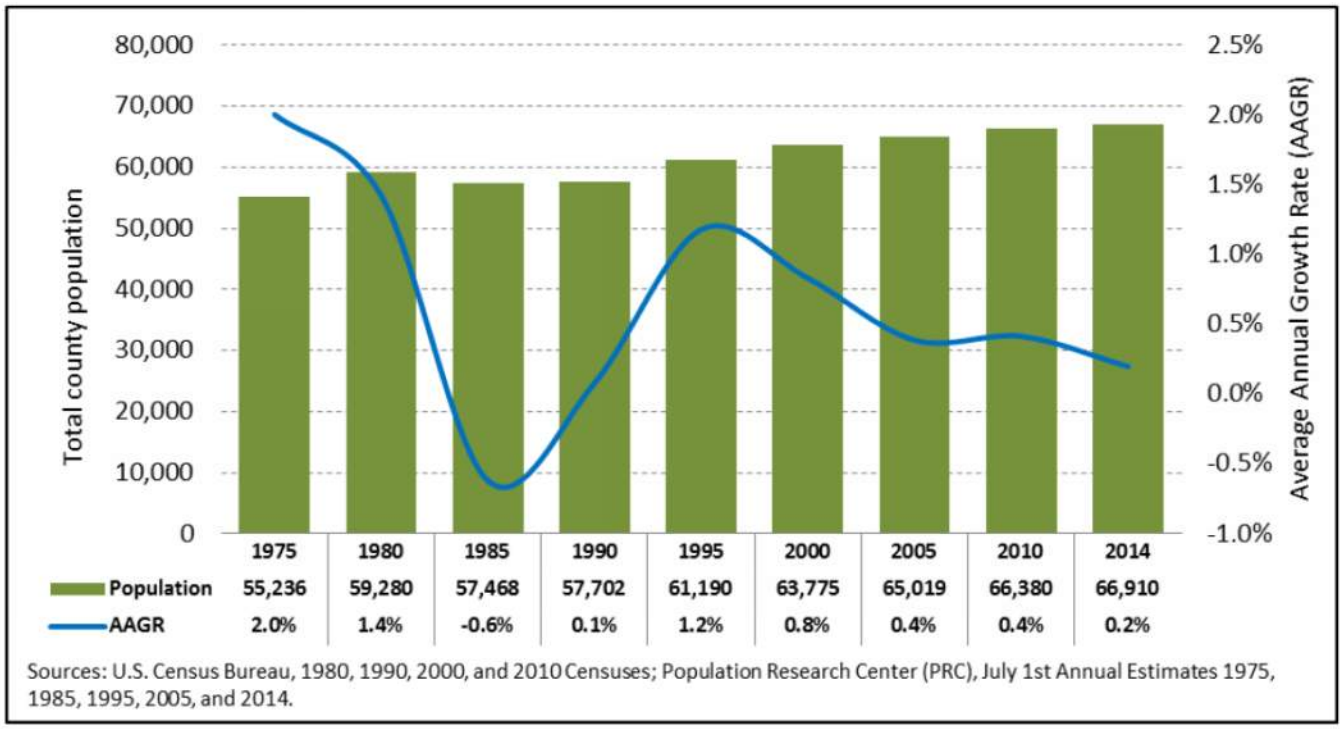


Figure 3-1. Klamath County – Total Population by Five-Year Intervals (Source: PSU PRC)

	Historical			Forecast				
	2000	2010	AAGR (2000-2010)	2015	2035	2065	AAGR (2015-2035)	AAGR (2035-2065)
Klamath County	*63,775*	*66,380*	*0.4%*	*67,043*	*72,164*	*69,591*	*0.4%*	*-0.1%*
Bonanza[1]	400	401	0.0%	441	513	641	0.8%	0.7%
Chiloquin	739	766	0.4%	768	803	849	0.2%	0.2%
Klamath Falls	41,541	42,567	0.2%	43,093	45,363	45,907	0.3%	0.0%
Malin	661	836	2.4%	833	926	1,035	0.5%	0.4%
Merrill	960	939	-0.2%	942	1,026	1,182	0.4%	0.5%
Outside UGBs	19,474	20,871	0.7%	20,966	23,534	19,977	0.6%	-0.5%

Sources: U.S. Census Bureau, 2000 and 2010 Censuses; Forecast by Population Research Center (PRC).

[1] *For simplicity each UGB is referred to by its primary city's name.*

Figure 3-2. Klamath County and Sub-Area – Historical and Forecast Populations, and Average Annual Growth Rates (AAGR). (Source: PSU PRC)

TRAFFIC VOLUME DEVELOPMENT

The expected increase in traffic volumes on ODOT highways and key roadways within the County was based on a review of past changes in traffic volumes as well as expected increases in population and area jobs. Further details on the anticipated growth in traffic volumes on roadways within the County is provided in Volume 2, Appendix C (Existing & Future Conditions Inventory & Analysis).

Existing and future roadway and intersection capacity and safety needs were reviewed at 25 intersections and along 18 roadway segments within the County. The estimation of future traffic volumes at these locations and the resulting capacity and safety analyses were performed using the procedures outlined in ODOT's Analysis and Procedures Manual (APM) and compared to applicable agency performance targets.

BASELINE ROADWAY AND INTERSECTIONS ANALYSES

The baseline (future) analysis served as the basis of the project list reflected in Chapter 4. This baseline analysis was guided by the transportation needs identified in the technical analysis and previously adopted plans and policies for the County, ODOT, and other agency partners.

IDENTIFIED TRANSPORTATION NEEDS

The results of the year 2040 future no-build analyses are summarized in Volume 2, Appendix C: Existing & Future Conditions Inventory & Analysis. The existing and future deficiencies analysis revealed:

- All of the highway intersections and roadway segments studied are anticipated to meet ODOT and County performance targets related to vehicular capacity in 2040.
- The existing intersections and roadway segments analyzed as part of the TSP are anticipated to have adequate capacity to accommodate future growth without needing any material changes in design or traffic control.
- Passing lanes are limited on several freight routes including US97 (south of Klamath Falls), OR39, and OR140 (east of Klamath Falls).
- The County lacks a connected and reliable Intelligent Transportation System (ITS) infrastructure. The majority of the ITS infrastructure within the County is located on ODOT facilities. Outside of the City of Klamath Falls, the County's system predominately consists of cellular or dial-up routers with several dedicated point to point circuits. Cameras are connected by either cellular or DSL connection. Several County variable message signs use dial-up connections.
- Klamath County's Transportation Safety Action Plan (TSAP) identifies countermeasures and prioritize safety-focused projects that may help reduce serious injuries and fatalities related to crashes within the county. The TSAP identified a total of 2,217 crashes were reported in Klamath County, outside of UGB areas between 2013 and 2017. Roadway departure crashes represented the most common crash type, accounting for 58 percent (1,287) of crashes. Systemic roadway engineering treatments were considered at key locations identified through the TSAP process. More information on the treatments and locations is provided in Chapter 4 and 5.
- The PAC identified several perceived safety needs in the County. These needs were taken into consideration for project location and treatments in Chapter 4.
- Roadways in the County have limited shoulder widths and carry high speed traffic with posted speeds between 45 and 55 mph. Shoulders are the primary option for people walking, biking, or rolling throughout the County. There is a lack of multi-use paths, sidewalks, and crossings in unincorporated areas, near schools, and adjacent to transit stops.
- Increased transit options are needed to facilitate travel throughout the County. There are several transit services within the County including Basin Transit, Quail Trail Public Transit, and the Amtrak

Thruway. Each service operates independently with little crossover to provide a connected system throughout the County. Additionally, the rural areas and unincorporated communities generally lack access to Dial-A-Ride services.

- No changes to existing freight, rail, pipeline, marine, or air systems were identified to serve the future needs of the County.

EVALUATION OF TRANPORTATION SYSTEM ALTERNATIVES TO ADDRESS IDENTIFIED NEEDS

The Project Advisory Committee (PAC), Project Management Team (PMT), and participants at open houses and other community forums identified transportation system alternatives that had the potential to address existing and future transportation needs. These potential system alternatives avoid principal reliance on any one mode of transportation and increase transportation choices for all users. The PMT developed these ideas into a potential project list that was screened by agency staff against the TSP's goals and objectives through the established evaluation criteria (see Volume 2, Appendix B (Goals, Objectives, & Evaluation Criteria). The potential solutions were reviewed and refined through community and PMT input to form the 20-year list of projects reflected in Chapter 5. Through this process, solutions that could address the identified needs as well as serve to accomplish key County objectives were evaluated. Some of the considerations that shaped the final list of recommended projects include:

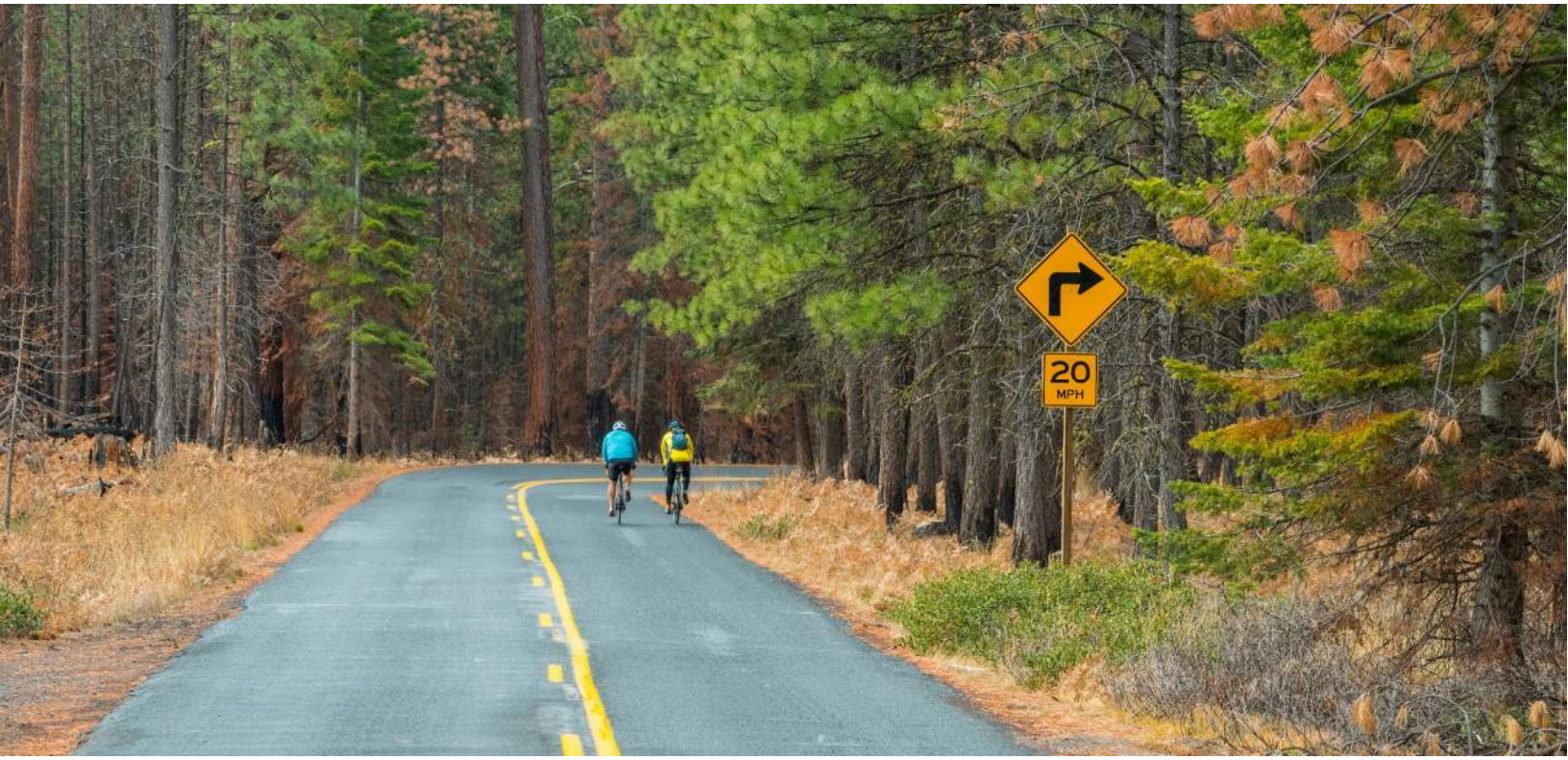
- Balancing impacts to existing and developable parcels with overall transportation system and community needs;
- Minimizing impacts to environmental resources;
- Supporting and enhancing key state and regional economic plans and priorities;
- Leveraging future transportation investments to reduce access, economic, safety and health disparities within the County, particularly those areas identified as serving populations of low income, minority, youth and/or the elderly.
- Addressing known safety issues;
- Increasing connections for people walking and riding bikes, especially in the unincorporated areas and to key transit stops;
- Improving mobility for through traffic and freight on state highways; and,
- Leveraging funding opportunities with key partner agency and private investments.

The resultant 20-year project list is intended to address the identified transportation needs, meet the TSP goals and objectives, and reflect the criteria included in ORS 660-012-0035. Details of the recommended project lists are provided in the next Chapter.

4

CHAPTER 4

MODAL PLANS AND PROJECTS



Source: Oregon Department of Transportation (ODOT)

4. MODAL PLANS AND PROJECTS

The TSP is a coordinated set of multimodal projects, policies, programs, and studies that address the transportation needs within the rural and unincorporated areas of the County over the next 20 years. This chapter provides an overview of the modal plans summarizing these elements.

> Driving will continue to be a primary mode of travel, but the TSP projects, policies, programs, and studies intend to increase transportation choices; reduce reliance on the automobile by better accommodating and encouraging travel by foot and bike for short trips; improve safety for all transportation users; and provide for improved transit service.

Although driving will continue to be a primary mode of travel in the County and the preservation and improvement of the existing roadway system will continue to remain important, the TSP projects, policies, programs, and studies intend to increase transportation choices; reduce reliance on the automobile by better accommodating and encouraging travel by foot and bike for short trips; improve safety for all transportation users; and provide for improved transit service. The TSP, in conjunction with the County's adopted land use plans and regulations, will ultimately result in land use patterns and transportation systems that make walking, biking, rolling, and use of transit convenient so that, on balance, people need to and are likely to drive less than they do today.

The TSP recommends transportation improvement projects, policies, programs, and studies to fulfill the plan's goals and objectives. These are organized into the following two categories, which suggest implementation timeframes based on complexity, likely available funding (including potential funding sources), and assessment of need:

- **TSP Project**: These are projects that are anticipated within the 20-year planning horizon but may still require additional funding or design work to implement. These projects are further prioritized as high, medium, and low, reflecting the relative need and ease of implementation of the projects. The priority categories are intended to be flexible and allow the County to revise as priorities change over time.
- **TSP Visionary Project**: These are projects not likely to occur in the 20-year planning horizon. However, they are documented to reflect longer-term needs and community desires and provide flexibility to adapt if circumstances change that may warrant the projects sooner. These projects are not considered within the 20-year list of financially constrained changes to the transportation system.

The intent of these categories is to provide the County with flexibility to adapt to changing economic development and community needs over the next 20 years. Some projects may be accelerated, and others postponed due to changing conditions, funding availability, public input, or more detailed study performed during programming and budgeting processes.

PROJECT PLANNING-LEVEL COST OPINIONS

The planning-level cost opinions for each project are provided in subsequent sections. All cost opinions are rounded and provided in 2020 dollars. Because the TSP is developed at a Countywide scale, project design elements may change before construction commences as public input, available funding, and unique site conditions are taken into consideration. As such, the design elements and cost opinions associated with the projects are identified for discussion and planning purposes and for determining a reasonable planning-level cost only. ***Potential right-of-way acquisition and significant environmental costs are not included***. The actual design and permitting elements for any facility are subject to change, will ultimately be determined through a preliminary and final design process, and are subject to County and/or ODOT approval. Please note that cost opinions and identified County contributions and partnerships are for planning-level purposes only. All projects will be scoped separately and individually based on specific needs at the time of development. Cost options are provided in Appendix 1B.

The subsequent sections provide an overview of each modal plan and a list of plan elements' descriptions, locations, cost opinions, funding agency, and lead agency followed by figures identifying the location and priority of projects. Many of the improvements demonstrate crossover between modal plans and funding opportunities. For example, the shoulder widening projects are classified as bicycle projects because they provide bicycle facilities, but they may also have a safety benefit by increasing the recoverable area for vehicles and paved areas for pedestrians to walk along a facility. While project types may overlap, projects are only described and referenced in one section to simplify tables and cost estimates. A table with a full list of all modal plan elements is provided in Appendix 1A.

Source: ODOT

ROADWAY PLAN

People driving, walking, rolling, biking, and taking transit all rely on the roadway and non-roadway network to access destinations locally within the County as well as regionally. The identified roadway solutions address mobility, access, freight, and safety needs.

ROADWAY JURISDICTION

Klamath County's motor vehicle system includes county roads and state highways outside of City UBGs. These facilities provide statewide, regional, and local traffic with the ability to access commercial, recreational, and other land uses within Klamath County and the region. Most roadways within Klamath County are owned and operated by the County, ODOT, the Bureau of Land Management (BLM), or the US Forest Service (USFS). Klamath County's roadway jurisdictions are shown in Figure 4-1.

FUNCTIONAL CLASSIFICATION

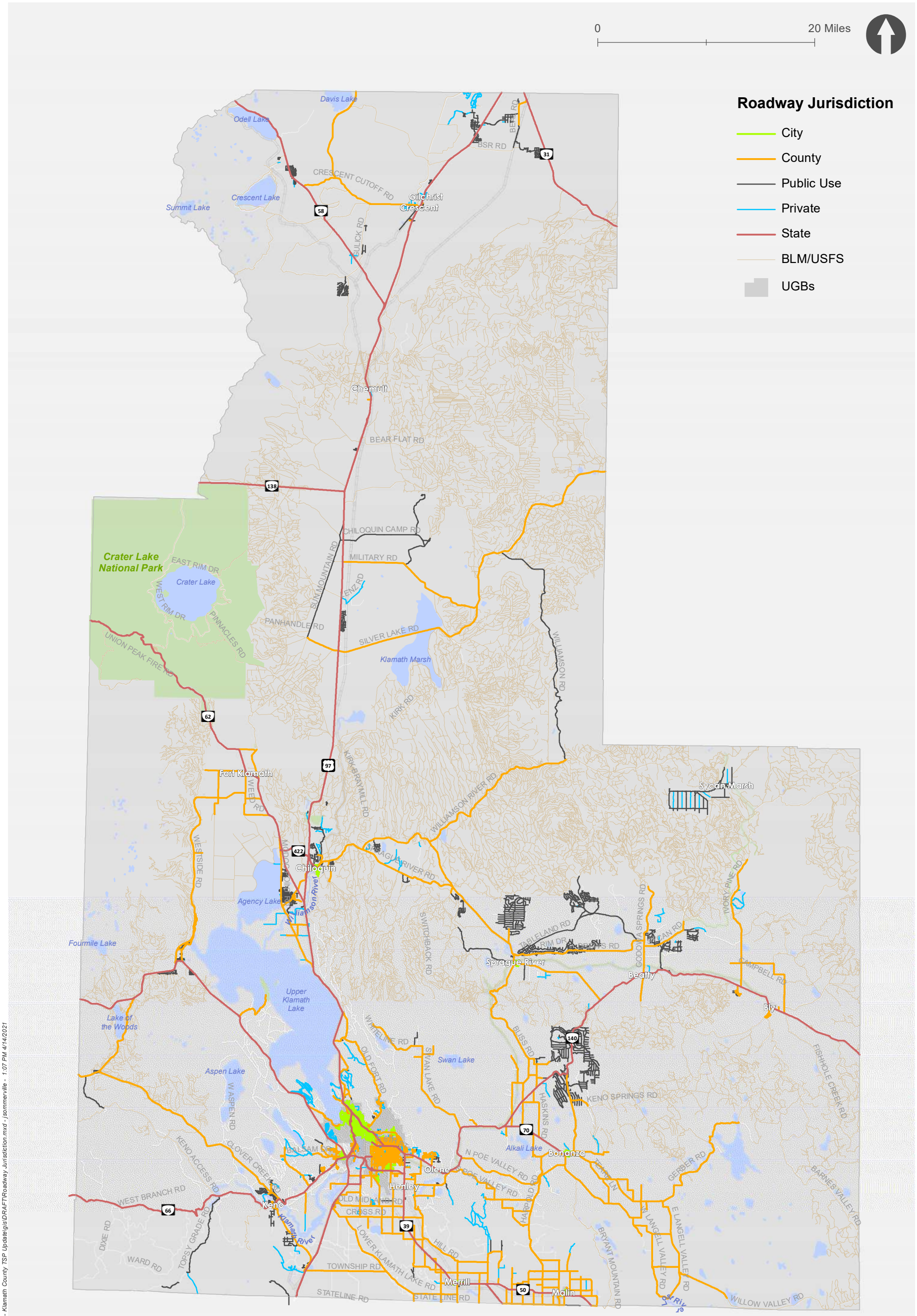
A roadway's functional classification defines its role in the transportation system and reflects desired operational and design characteristics such as right-of-way requirements, pavement depths and widths, speed limits, and pedestrian and bicycle features. The roadway functional classification map for Klamath County is shown in Figure 4-2.

The functional classification system corresponds to Klamath County roadway design standards to provide a distinction between roads in the urban area and those in rural areas. Roadways within the Klamath Falls Urban Growth Boundary (UGB) are considered "urban" and roadways outside of the UGB are considered

"rural." These designations allow the County to apply design standards that are appropriate for a roadway's urban or rural context.

All County roads covered within this TSP are outside the UGB and therefore considered rural. The functional classification map includes the following designations:

- Rural Roads, outside of Urban Growth Boundaries:
  - Principal Arterials (State Highways)
  - Major Arterials
  - Minor Arterials
  - Major Collectors
  - Minor Collectors
  - Local Roadways, summarized in the following subcategories:
    1. Low-Volume Collectors
    2. County-Maintained Local Roads
       - Standard Local Roads (typical local County roadways)
       - Community Local Roads (roadways within unincorporated communities)
    3. User-Maintained Public Roads



*Areas within city limits (Klamath Falls, Merrill, Malin and Chiloquin) are not included in the County's TSP.

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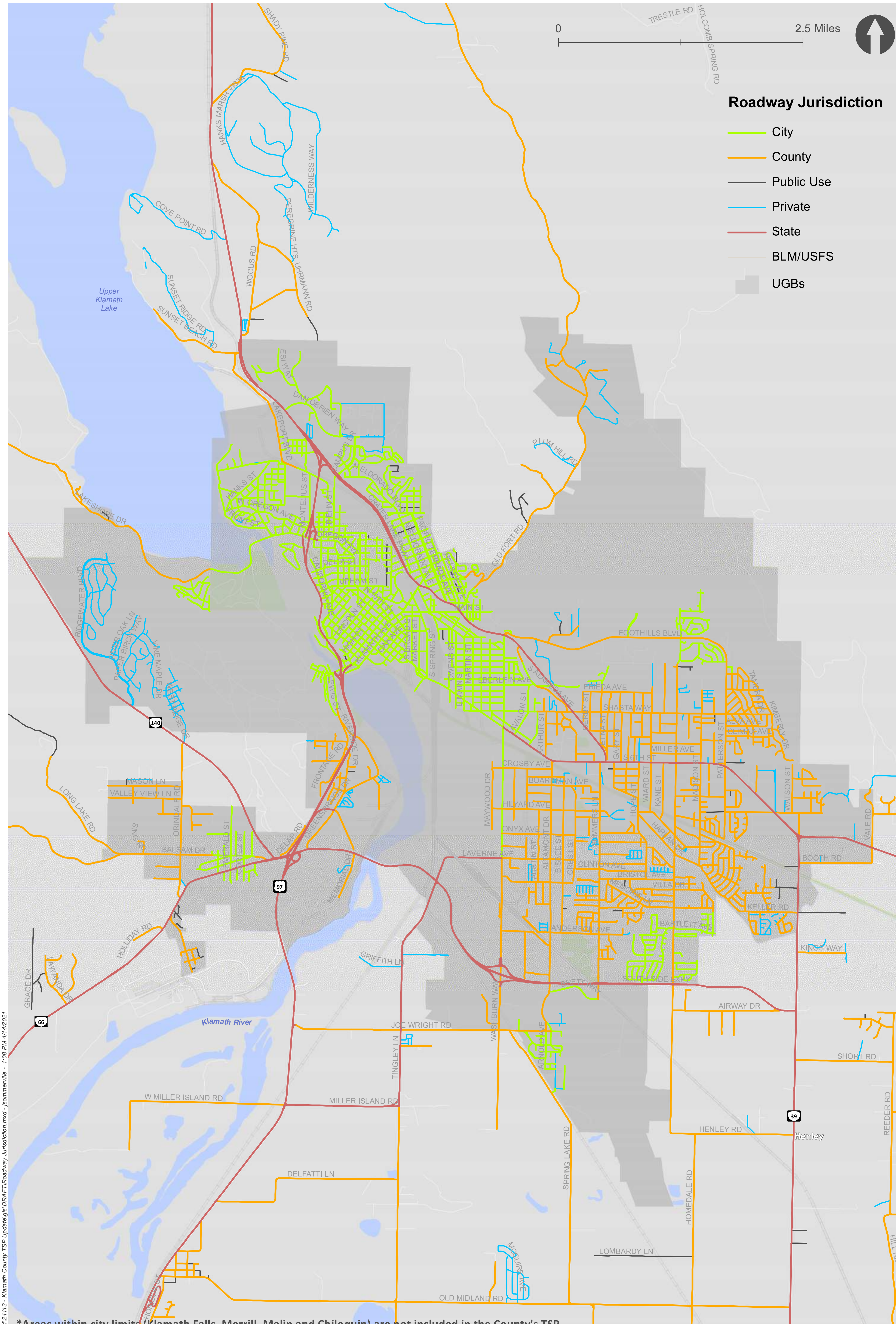
Roadway Jurisdiction
Klamath County, Oregon

Figure **4-1A**

KITTELSON & ASSOCIATES

Coordinate System: NAD 1983 HARN StatePlane Oregon South FIPS 3602 Feet Intl



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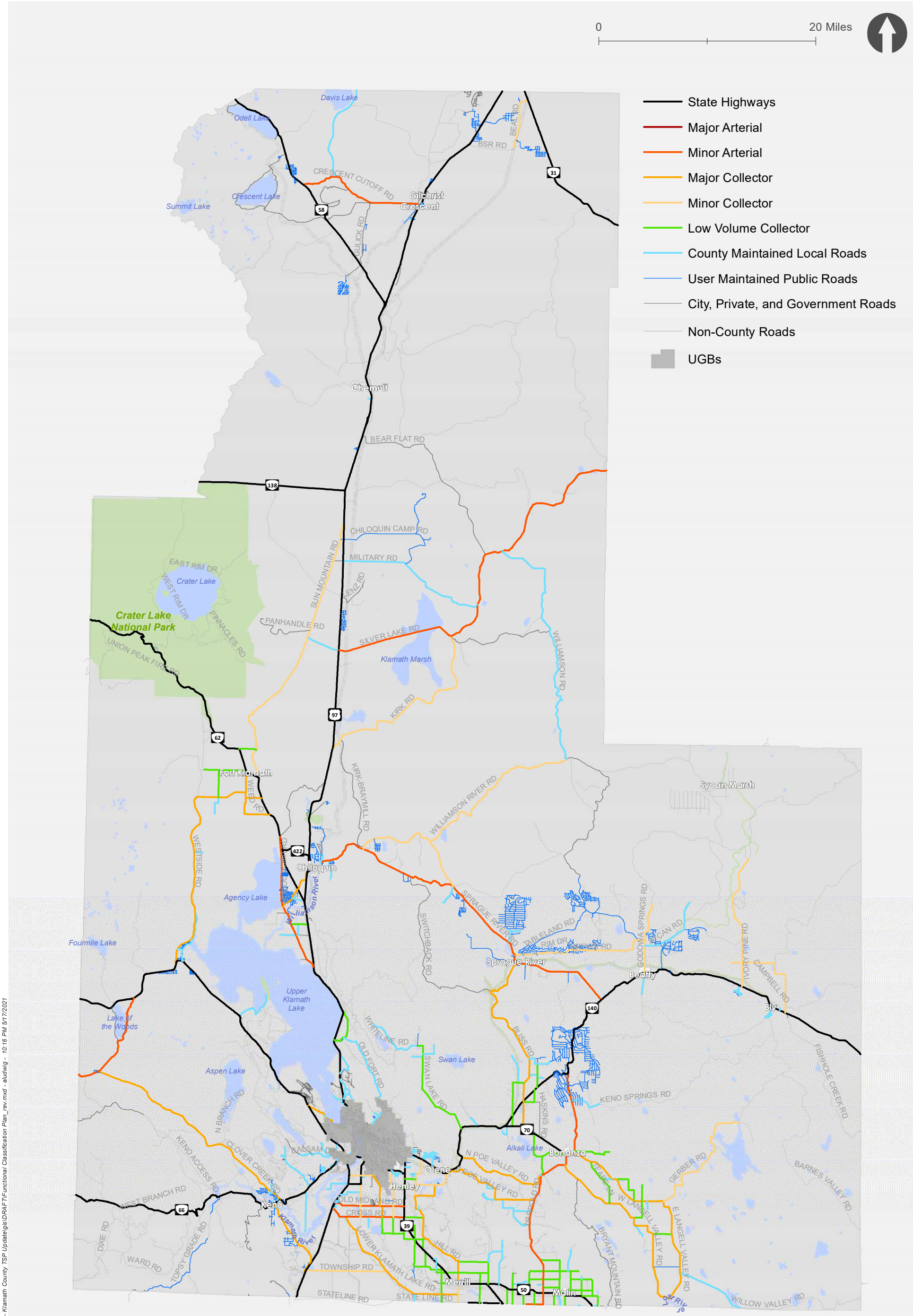
Roadway Jurisdiction
Klamath County, Oregon

Figure
4-1B

KITTELSON & ASSOCIATES

Coordinate System: NAD 1983 HARN StatePlane Oregon South FIPS 3602 Feet Intl



*Areas within city limits (Klamath Falls, Merrill, Malin and Chiloquin) are not included in the County's TSP.

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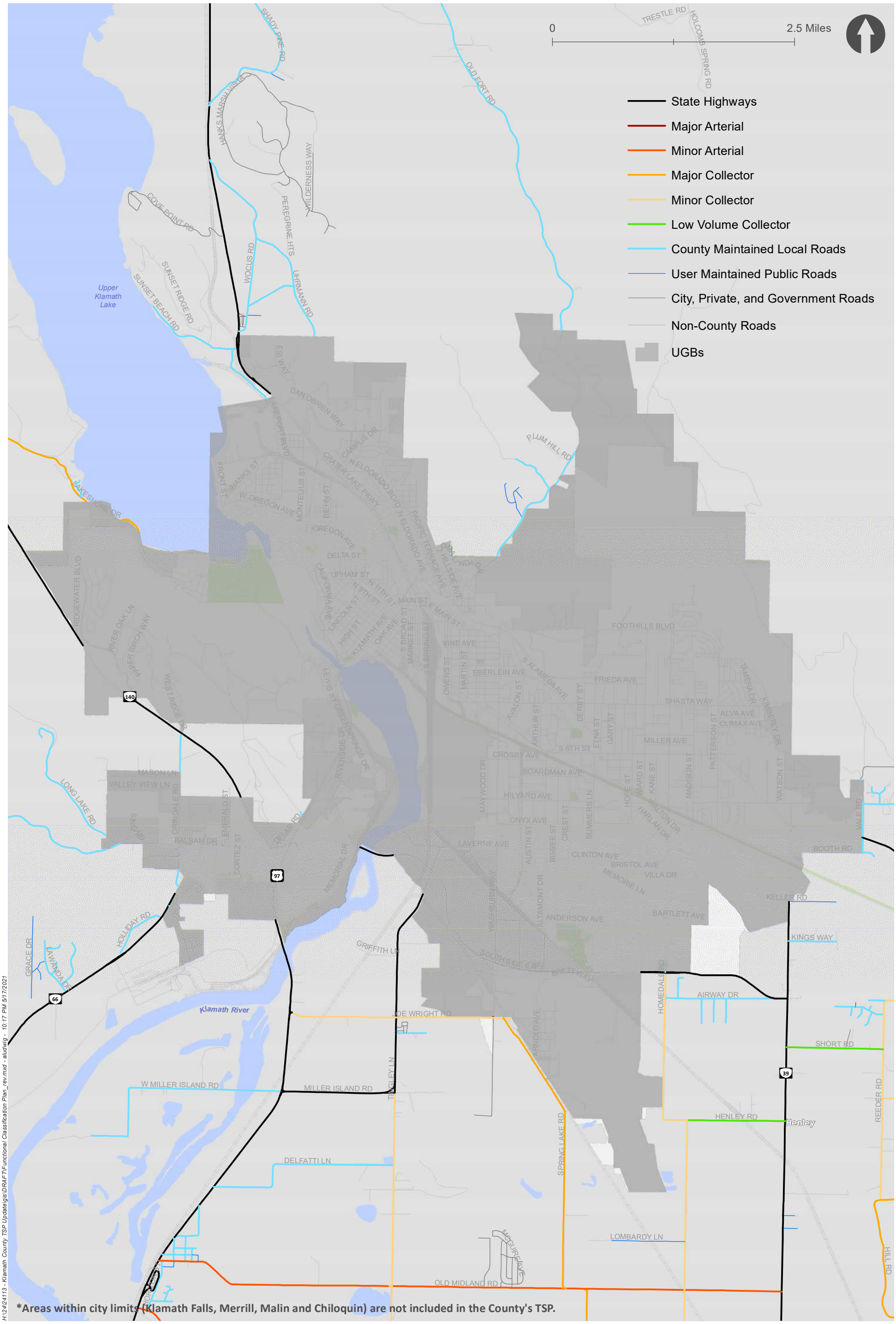
Functional Classification Plan
Klamath County, Oregon

Figure
4-2A

KITTELSON & ASSOCIATES

Coordinate System: NAD 1983 HARN StatePlane Oregon South FIPS 3602 Feet Intl



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Functional Classification Plan
Klamath County, Oregon

Figure **4-2B**

KITTELSON & ASSOCIATES

Coordinate System: NAD 1983 HARN StatePlane Oregon South FIPS 3602 Feet Intl

ROADWAY STANDARDS AND CROSS SECTION GUIDELINES

Roadway design standards provide information on how facilities within each of the functional classifications "look and feel." The County's Land Development Code Section 71.030 – General Roadway Design Standards provide design standards for roadways, including travel lane width, number of travel lanes, shoulder width and type, bicycle and pedestrian facilities, and total right-of-way width. These standards identify how existing roadways can be modified and new facilities can be constructed to accommodate the needs of people walking, biking, rolling (disabled people or people recreating), taking transit, driving motor vehicles, and moving freight.

In some cases, features may be added or omitted on a case-by-case basis and per the direction of the County Public Works Director, when the criteria provided in the Land Development Code 71.030.C are satisfied.

All roadways classified as rural Principal Arterials in Klamath County are state owned and maintained highways (all elements of road design shall be coordinated with ODOT); Klamath County Public Works does not have jurisdiction over any Rural Principal Arterial roadways.

Recommended amendments to the County's Land Development Code include the General Roadway Design Standards. These are provided in Appendix 1E, Implementation Recommendations.

ACCESS MANAGEMENT AND ACCESS SPACING

Providing adequate access to roadways, land uses, and key destinations is a critical part of operating and planning for an effective and safe transportation system for all users. Access management strategies and implementation require careful consideration to balance access and mobility in a safe and efficient manner. In general, access management is generally more stringent on higher classified roads where mobility is the highest priority. ODOT and the County maintain standards to help balance the needs for both "through travelers" (including freight and public transportation) as well as serving the needs of area residents, landowners, businesses, and visitors.

Providing adequate access to roadways, land uses, and key destinations is a critical part of operating and planning a safe, effective transportation system for all users.

State Facilities

ODOT specifies access management spacing standards in the Oregon Highway Plan (OHP) and OAR 734-051-4020(8). Applicable access management spacing standards for statewide, regional, and district highways are summarized in Table 4-1and Table 4-2.[1]

[1] Note: Standards applying only to urban areas and urban expressways have been excluded for the summarized standards, as they are not applicable to the study area of this TSP.

Table 4-1. ODOT Access Management Spacing Standards for Statewide Highways with <5,000 AADT

Posted Speed (mph)	Regional & Highways District Highways	Statewide Highways	Statewide Highways
	Rural and Urban Areas	Rural Areas	Unincorporated Communities in Rural Areas
>55	650	1320	1320
50	425	1100	1100
40 & 45	360	990	750
30 & 35	250	770	425
25 & lower	150	550	350

Source: OHP Appendix C.

Table 4-2. ODOT Access Management Spacing Standards for Statewide Highways with >5,000 AADT

Posted Speed (mph)	Rural Expressway	Rural Areas
	Spacing (ft)	
>55	650	1320
50	425	1100
40 & 45	360	990
30 & 35	250	770
25 & lower	150	550

County Facilities

The County's access management standards differentiate between rural and urban roads. Table 4-3 summarizes the access spacing standards for rural roadways.

Table 4-3. Rural County Access Management Spacing Requirements

Functional Class	System Spacing[1]	Driveway/Access Spacing[2]	Corner Clearance
Minor Arterial	1 mile	500 feet[1]	600 feet
Major Collector	1,320 feet	250 feet[1]	100 feet
Minor Collector	1,320 feet	250 feet[1]	50 feet
Local	400 feet	75 feet	25 feet

FREIGHT SYSTEM

Freight is a critical component of the Klamath County regional network and promotes economic growth and development throughout the County. There are several designated Oregon Highway Plan (OHP) Freight Routes in the County as shown in Figure 4-3. All designated freight routes on this figure are

Reduction Review Routes[2]. In addition, US97, OR58, and OR140 (east of Klamath Falls) are High Clearance Routes[3]. While not designated OHP freight routes, OR31 is a High Clearance Route and a Reduction Review Route, and OR 138 is a Reduction Review Route.

Freight traffic uses several other statewide highways and County roadways to access locations such as airports, industrial facilities, farms, etc. However, there are no designated County freight routes.

VEHICULAR SYSTEM PERFORMANCE

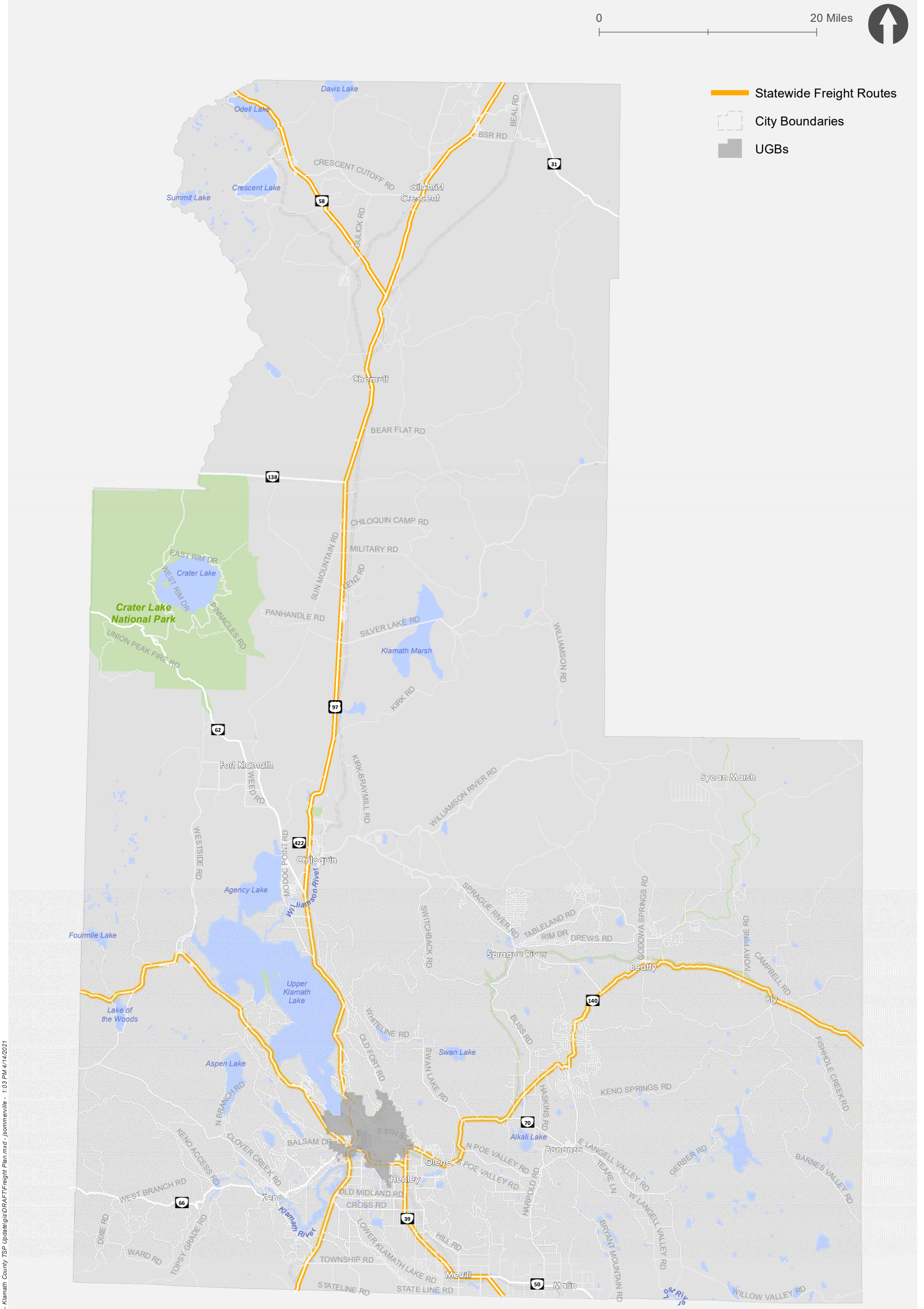
The County uses motor vehicle level of service (LOS) standards to evaluate acceptable vehicular performance on its roadway system. LOS standards are presented as grades A (free flow traffic conditions) to F (congested traffic conditions). ODOT uses mobility targets based on volume to capacity (V/C) ratios to evaluate acceptable vehicular performance on state facilities. As V/C ratios approach 1.0, traffic congestion increases.

In some cases, it may not be possible or desirable to meet the designated mobility target or LOS standards. In those cases, an alternative mix of strategies such as land use, transportation demand management, safety improvements, or increased use of active modes may be applied.

The LOS and mobility targets in Klamath County are listed below. ODOT mobility targets apply to state highways and intersections.

- County Roadways and Intersections – LOS D for signalized intersections and LOS E for unsignalized intersections
- ODOT Highways and Intersections – use mobility targets identified in Table 6 of the *Oregon Highway Plan* (OHP). Highways within the County include: US97, OR58, OR138, OR422, OR62, OR70, OR429, OR39, and OR140.

[2] Routes identified as "Reduction Review" must abide by ORS 366.215 prohibiting a reduction in the vehicle carrying capacity unless permitted by the Oregon Transportation Commission for safety purposes.
[3] High Clearance Routes are established by ODOT and freight stakeholders as those most important for moving oversize freight loads, particularly tall loads.



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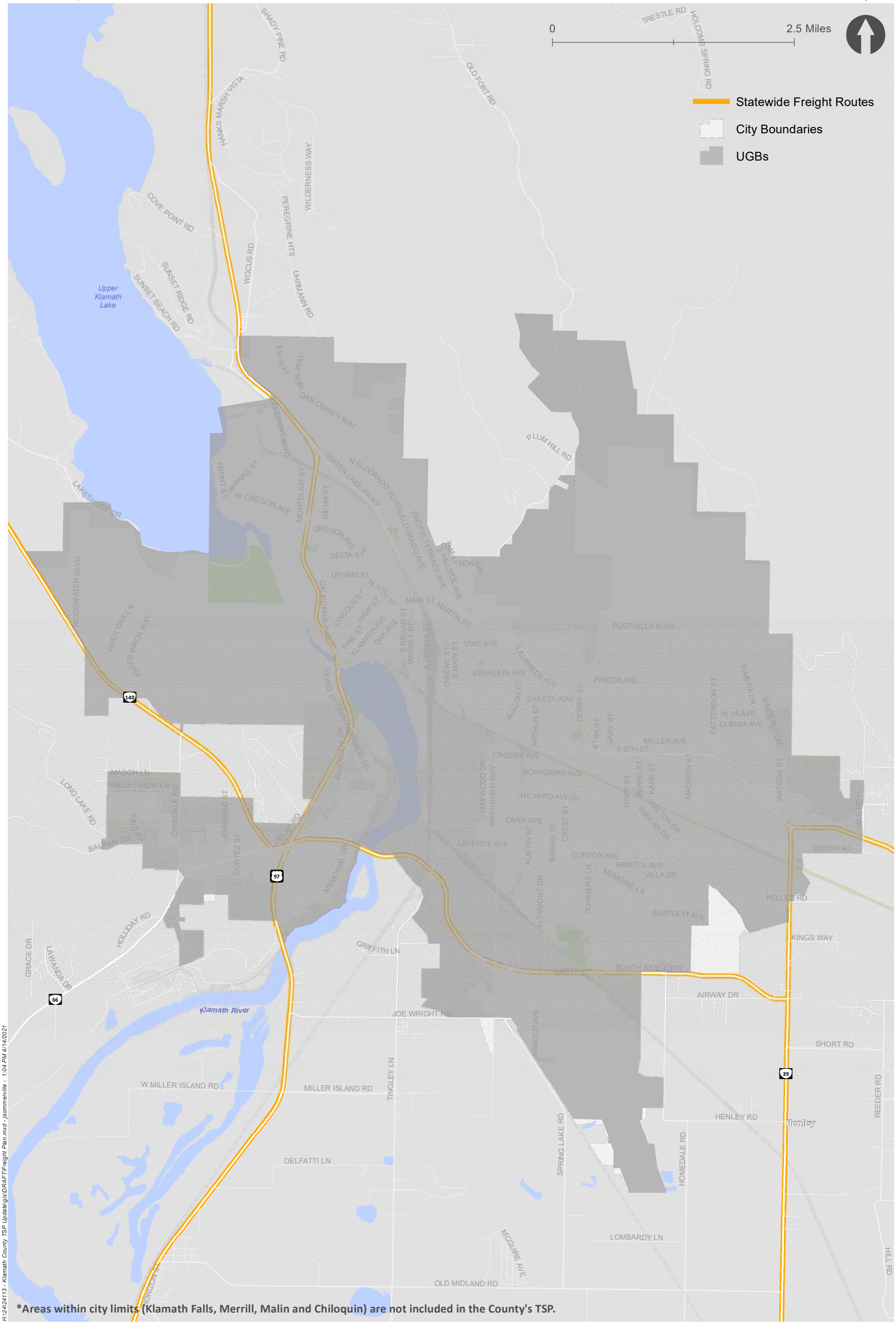
Freight Plan
Klamath County, Oregon

Figure
4-3A

KITTELSON & ASSOCIATES

Data Source: ODOT (Statewide Freight Routes)



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Freight Plan
Klamath County, Oregon

Figure **4-3B**

KITTELSON & ASSOCIATES

Data Source: ODOT (Statewide Freight Routes)

ROADWAY ELEMENTS

Technical analyses and feedback received from ODOT, the County, PAC members, and the public revealed the need and support for the following roadway, ITS, and safety projects and studies, which intend to improve the roadway system for all users.

Roadway projects are comprised of passing lane studies, corridor extension projects, and intersection evaluation projects. Roadway projects are presented in Table 4-4 and Figure 4-4. No roadway or intersection capacity deficiencies are anticipated within the study area through the planning horizon; therefore, roadway projects focus on improving mobility and connectivity. Additional details of key roadway projects are provided in the following sections.

Passing Lanes (R-1, R-2, R-3, R-4)

Several passing lanes have recently been constructed along US97 in the northern area of the County; however, no passing lanes are present along State highways or freight routes south or east of Klamath Falls. As freight and recreational travel increase between Oregon and California, passing lanes may improve the operations and safety of State highways within the County. These passing lane studies are intended to focus efforts on the locations identified by the PMT and PAC for consideration. Additional detailed analyses of available right-of-way, full corridor operations, environmental impacts, and design considerations are needed to determine the optimal location and lengths for these passing lanes.

OR140/OR39 Intersection Evaluation and Extension (R-5, R-6, R-7)

Carried forward from the existing TSP, the OR140/OR39 intersection evaluation and extension project would create an intersection improvement at OR140 (Southside Expressway)/OR39, including the new connection between OR 39 and OR140 (near MP 9.8), approximately 4 miles in length. This connection would provide a more direct connection to OR 140 in Olene, reducing travel time, providing route options for motorists and freight, and minimizing delay and potential conflicts at intersections. This connection would require the extension of Reeder Road, a new bridge over the Lost River canal, and a bridge over Bureau of Reclamation (BOR) B Canal. The new alignment would also require a Goal Exception from the Department of Land Conservation and Development (DCLD) and OAR 734-051. Therefore, an Interchange Area Management Plan (IAMP) should be prepared to evaluate the appropriate intersection form at OR140/OR39 and to confirm the need for and refine the connection to OR140.

Northern Passage Connection (R-12)

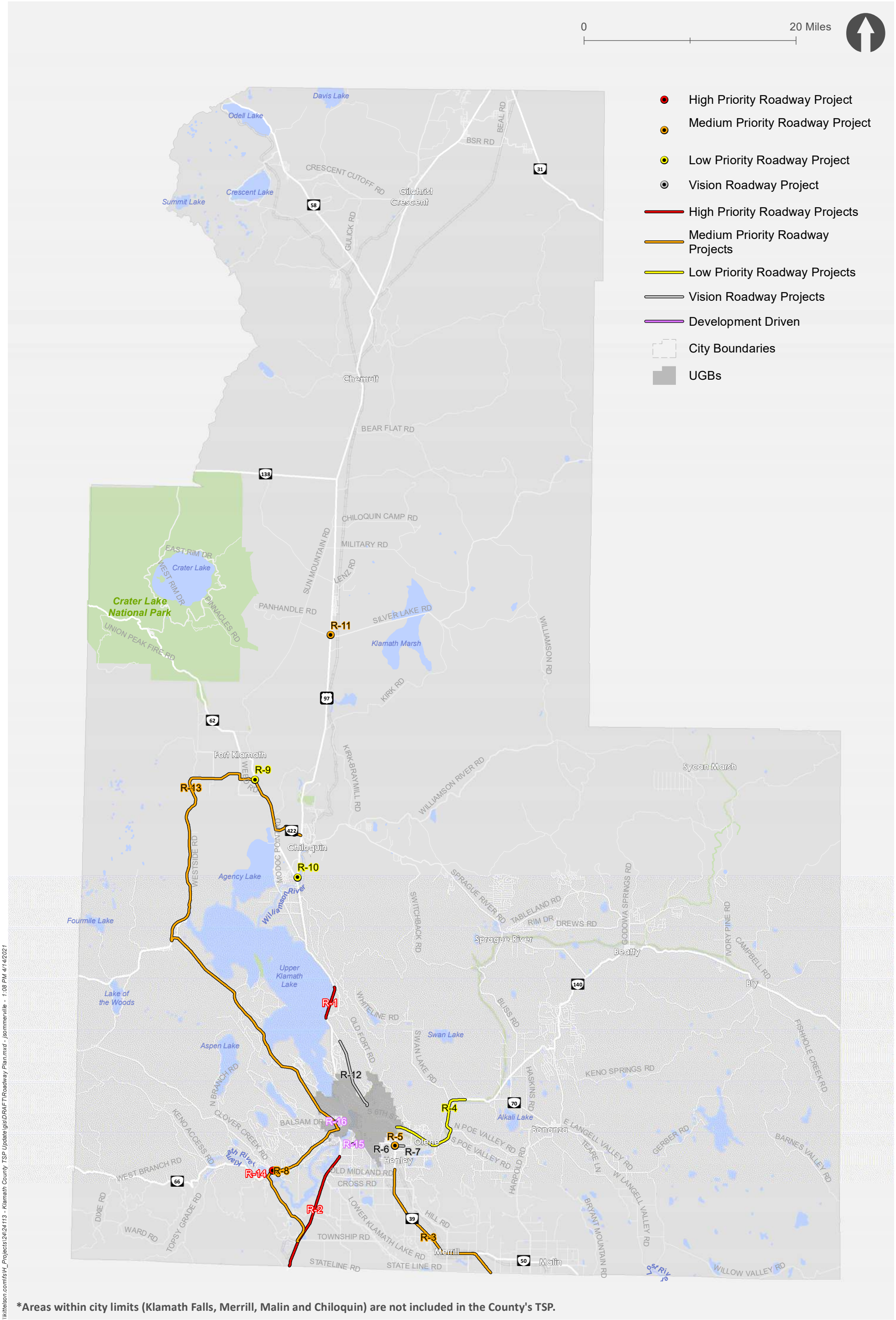
The previous TSP identified a north-south connection north of Klamath Falls that serves as an alternate route to the Crater Lake Parkway corridor. This new road would extend from Foothills Boulevard to Shady Pine Road and provide connections to Old Fort Road, Oregon Tech (OIT), and Sky Lakes Medical Center. A corridor plan would be required to determine the alignment, evaluate intersections, and identify other local roadway connections. This project would further support the need for safety improvements at the US97/Shady Pine Road intersection, as identified in the Safety Projects.

Table 4-4. Roadway Projects

Project ID	Project Name	Project Description	Cost Estimate[1]	Expected County Contribution	Funding Partner	Lead Agency
High Priority						
R-1	US97 North Passing Lane Study	Conduct a passing lane feasibility study for US97 between Algoma Road intersections to determine appropriate location for a passing lane.	$75,000	$0	ODOT	ODOT
R-2	US97 South Passing Lane Study	Conduct a passing lane feasibility study for US97 between Midland and California border to determine appropriate locations for passing lanes.	$75,000	$0	ODOT	ODOT
R-14	OR66/Clover Creek Road	Improve intersection sight distance and by realigning the intersection to reduce open pavement with a raised or striped median and tightening the turn radius, installing a second stop sign in the raised median, and installing "stop ahead" pavement markings.	$1,000,000	$100,000	ODOT	ODOT
Medium Priority						
R-3	OR39 South Passing Lane Study	Conduct a passing lane feasibility study for OR39 south of Klamath Falls to California border to determine appropriate locations for passing lanes.	$75,000	$0	ODOT	ODOT
R-5	OR140/OR39 and Reeder Extension IAMP	Complete an Interchange Area Management Plan for OR140/OR39 including an extension of the Southside Expressway to the Klamath Falls-Lakeview Highway in Olene. Include evaluation of Henley School access.	$250,000	$0	ODOT	ODOT
R-8	OR66 Curve Warning Enhancements (MP 51.2 to 51.5)	To improve safety on the horizontal curve, provide curve warning and visibility treatments such as advance curve warning flashers (on existing curve signs); raised/recessed pavement markers; frequent post-mounted delineators; guardrail; chevron signs; oversized, doubled up, and/or fluorescent yellow sheeting for advance curve warning signs; and shoulder rumble strips. This project may have safety benefits. Crash reduction factors (CRFs), based on ODOT's approved CRF list, for the project elements include: • Curve warning flashers: 10% for curve crashes • Raised/recessed pavement markers: 15% for night crashes • Post-mounted delineators: 30% for curve crashes • Guardrail: 47% for road departure crashes • Chevron signs: 16% for road departure crashes • Oversized/doubled up/fluorescent yellow sheeting (curve warning signs): 20% for road departure crashes • Shoulder rumble strips: 22% for road departure crashes	$100,000	$0	ODOT	ODOT
R-11	US97/Silver Lake Road Left Turn Lane	Construct a dedicated northbound left-turn lane and widen shoulders at intersection to improve safety.	$1,000,000	$0	ODOT	ODOT
R-13	Alternate Emergency Route to US97	Designate an alternate route for vehicles and freight on OR422, OR62, Westside Road, OR140, OR66, and Keno Worden Road in case of emergency closure or shut down of US97. Provide alternate route signage and designation. In cases of tight curves, curve treatments (signs, flashers, delineators, chevrons, guardrail, etc.) and "narrow road" warning signs may be needed.	$50,000	$25,000	ODOT	ODOT
Low Priority						
R-4	OR140 East Passing Lane Study	Conduct a passing lane feasibility study for OR140 east of Klamath Falls to County Line to determine appropriate location(s) for passing lanes.	$75,000	$0	ODOT	ODOT
R-9	OR62/Loosley Road Left Turn Lane	Construct a dedicated northbound left-turn lane and widen shoulders at intersection to support as an alternate freight route to US97.	$590,000	$0	ODOT	ODOT
R-10	US97/Kia-Mo-Ya Casino Access IAMP	Prepare an Interchange Area Management Plan (IAMP) to determine the appropriate intersection form.	$250,000	$0	ODOT, Klamath Tribes	ODOT
Development Driven						
R-15	New Collector, East of Tingley Lane	Construct new connector, approximately 0.5 mile in length, extending east of Tingley Lane		$0	Development	County
R-16	Delap Pit Access Road	Construct a minor collector to provide access to the property. Alignment to be determined by future development and ODOT Access Spacing Standards.		$0	Development	County
Vision						
R-6	OR140/OR39 Intersection Evaluation	Design and construct an intersection improvement as determined by IAMP (R-5).	-	-	-	-
R-7	OR140 East Extension	Extend OR140 (Southside Expressway) to OR140 (Klamath Falls-Lakeview Hwy) in Olene as determined by IAMP (R-5). Should be coordinated with interchange (R-6).	-	-	-	-

Project ID	Project Name	Project Description	Cost Estimate[1]	Expected County Contribution	Funding Partner	Lead Agency
R-12	Northeast Passage Connection - Shady Pine to Foothills	Extend Foothills Blvd to Shady Pine Road. Includes access to OIT and Sky Lakes.	-	-	-	-

[1]Cost estimates are preliminary and do not include right-of-way or environmental impacts.



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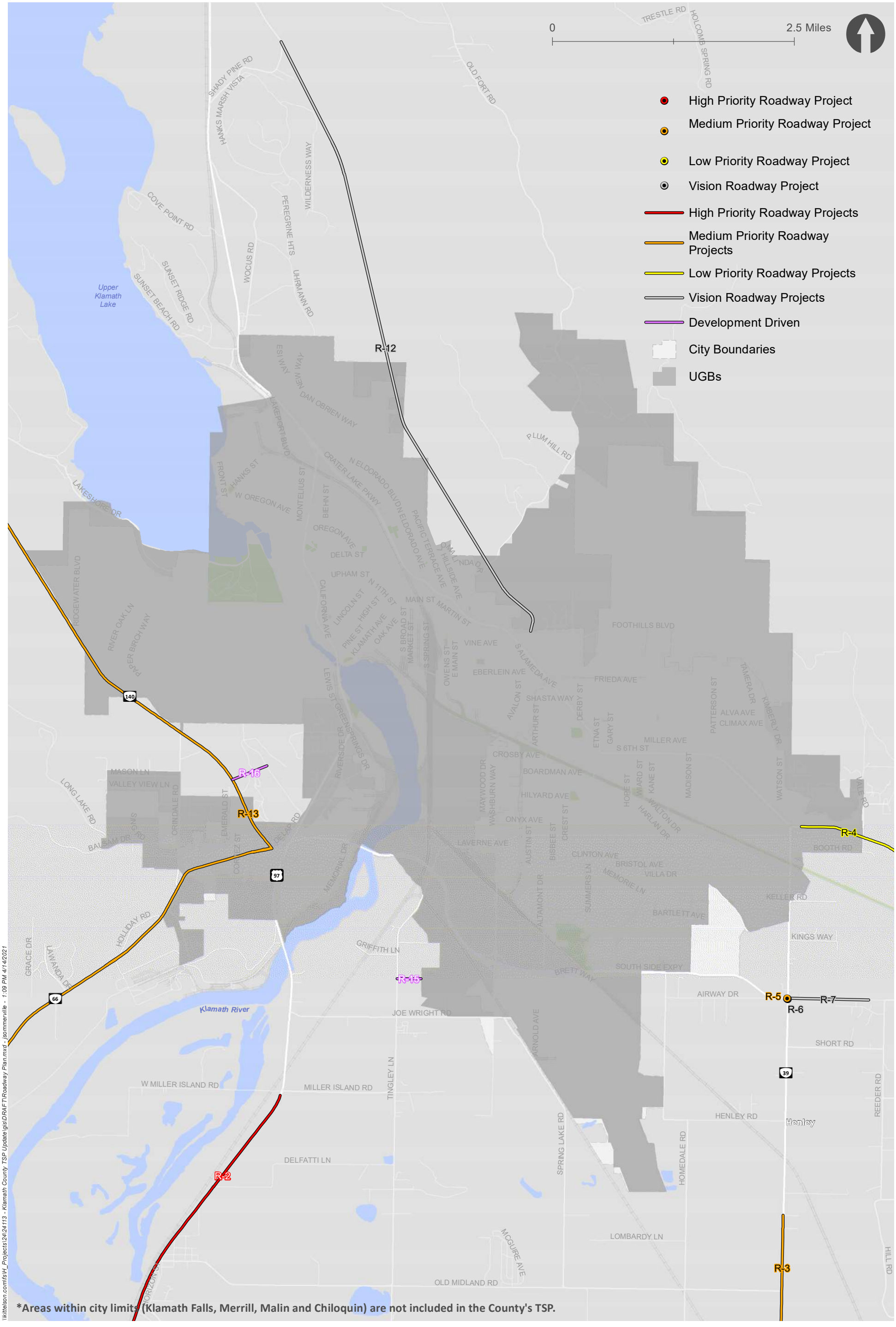
Roadway Plan
Klamath County, Oregon

Figure
4-4A

KITTELSON & ASSOCIATES

Data Source: ODOT (Statewide Freight Routes)



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Roadway Plan
Klamath County, Oregon

Figure **4-4B**

KITTELSON & ASSOCIATES

Data Source: ODOT (Statewide Freight Routes)

TRANSPORTATION SYSTEM MANAGEMENT AND OPERATIONS ELEMENTS

Transportation System Management and Operations (TSMO) is a set of strategies to optimize performance, safety, and reliability of the transportation system by implementing various methods to preserve capacity and maximize performance of transportation facilities that already exist. One TSMO strategy is Intelligent Transportation Systems (ITS) technology. ITS infrastructure enhances traffic flow, maintenance activities, and safety through the application of technology. The provision of reliable ITS infrastructure to inform system users about incidents, weather conditions, and congestion is a useful and cost-effective tool for rural areas, such as Klamath County.

> Reliable ITS infrastructure to inform system users of incidents, weather conditions, and congestion is a useful, cost-effective tool for rural areas, like Klamath County.

Klamath County adopted an ITS Plan (*Klamath County ITS Plan, 2016*) that addresses key needs in the County such as weather event management, emergency/incident management, maintenance management, and freight management. Table 4-5 presents the solutions described in the ITS plan that relate to the needs of unincorporated Klamath County. In addition, the final study in the table calls for an update to the ITS Plan to incorporate new technologies. The cost estimates shown in the table are obtained from the ITS Plan, adjusted for inflation, unless otherwise noted. Figure 4-5 is the existing infrastructure and proposed solutions map from the *Klamath County ITS Plan*.[4]

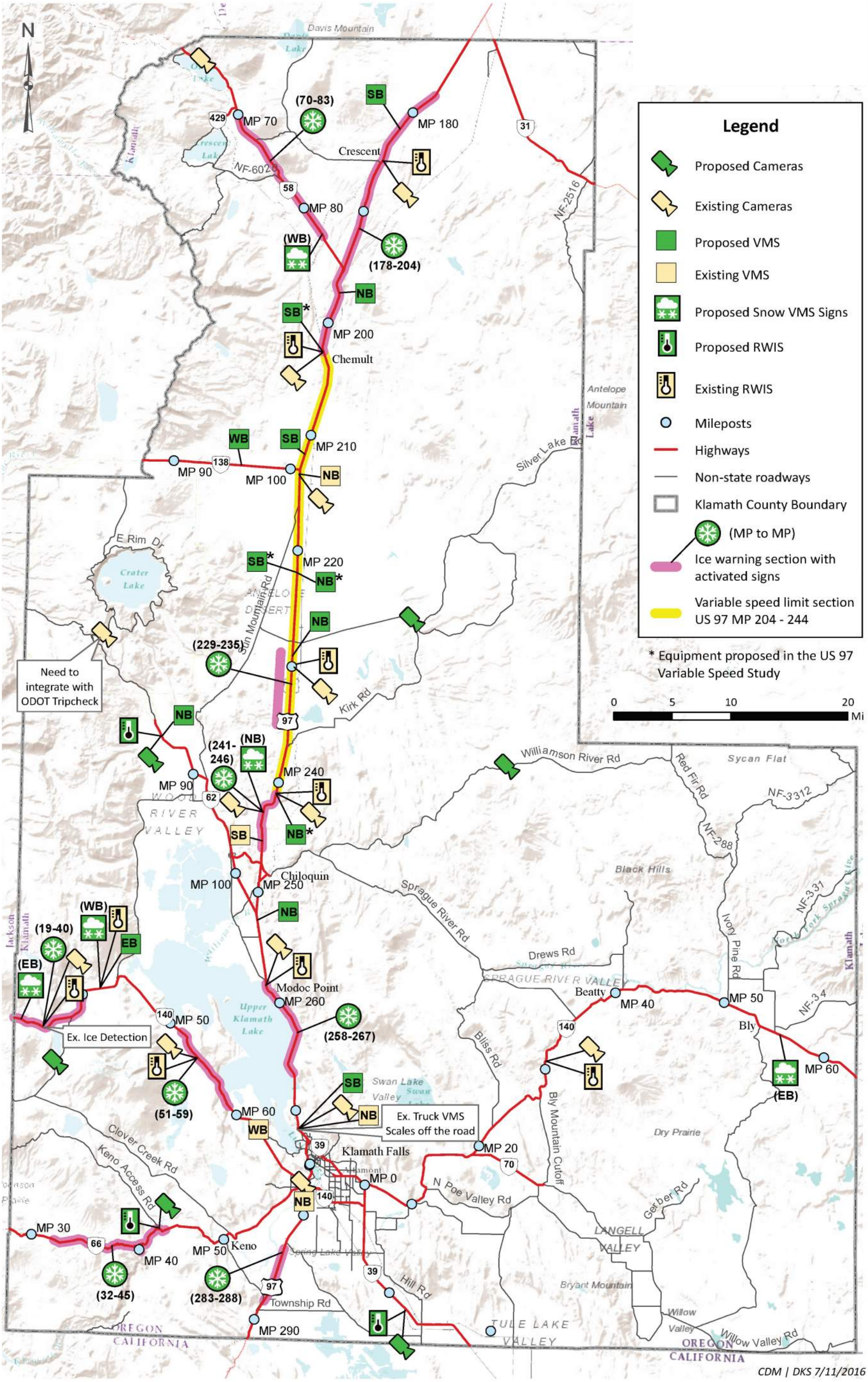
[4] The full ITS Plan can be accessed at the following link: https://www.oregon.gov/odot/Maintenance/Pages/Plans,-Architectures-%26-Reports.aspx. The table in the TSP lists projects; the full ITS Plan provides a detailed analysis of ITS needs and broader recommendations.

Table 4-5. ITS Projects

Project ID	Project Name	Project Description	Cost Estimate[1]	Expected County Contribution	Funding Partner	Lead Agency
High Priority						
I-1	Install communications and maintain up to date communications map.	Install roadside communication connections (as described in the communications plan in the Klamath County ITS Plan)	$50,000	$0	ODOT	ODOT
I-2	Install new PTZ cameras at select intersections and connect to TripCheck	Install at US97 Mile Post 271.2 (Truck Weigh Station)	$10,000	$0	ODOT	ODOT
I-3	Install Variable Message Signs (VMS)	Install at: a) SB US97 north of Crescent Cutoff Road; b) NB US97 south of OR58; c) SB US97 MP 204; d) SB US97 north of OR138; e) NB and SB US97 at MP 223; f) NB US97 at Silver Lake Road; g) NB US97 at MP 244; h) NB US97 at Sprague River Road; i) SB US97 north of Klamath Falls UGB; j) EB OR140 west of Westside Road; k) NB OR62 near Crater Lake exit; l) WB OR138 near Crater Lake exit	$6,000,000 (approx. $500,000 each)	$0	ODOT	ODOT
I-4	Install cameras with live feed capabilities	Install at: a) Silver Lake Road MP 27; b) Dead Indian Road MP 30.6; c) Williamson River Road MP 17; d) OR140 near MP 20-24; e) OR39 near Merrill; f) OR66 MP 43; g) OR62 MP 84	$280,000 (approx. $40,000 each)	$28,000 (approx. $4,000 each)	ODOT	ODOT
I-5	Connect Crater Lake National Park camera to TripCheck and display snow zone and gas information	Connect camera on Munson Valley road at Park entrance to ODOT TripCheck System to display snow zone information and gas availability at the park.	$10,000	$1,000	ODOT, NPS	NPS
I-10[2]	Install Road Weather Information Systems (RWIS) with ice detection	Install at: a) OR140 MP 20-24; b) OR39 near Merrill; c) OR66 MP 43; d) OR62 MP 84; e) weather station at Crater Lake	$220,000 (approx. $44,000 each)	$0	ODOT	ODOT
I-11[2]	Install activated ice warning signs	Install at: a) OR140 MP 19-40; b) OR140 MP 51-59; c) US97 MP 178-204; d) US97 MP 229-235; e) US97 MP 241-246; f) US97 MP 258-267; g) US97 MP 283-288; h) OR66 MP 32-45; i) OR58 MP 70-83	$440,000 (approx. $49,000 each)	$0	ODOT	
I-12	Install automatic changeable snow zone and chain restriction signs	Install at: a) NB US97 near MP 240-243; b) WB OR140 MP 41; c) EB OR140 near MP 25-35; d) OR140 near MP 53-57; e) WB OR58 near Odell Butte	$550,000 (approx. $110,000 each)	$0	ODOT	ODOT
I-15	Install Automated Vehicle Location (AVL) and logging capabilities (sanding, de-icing, and spraying) in maintenance and construction vehicles	Install AVL and activity logging capabilities in maintenance and construction vehicles and create an automated process for trucks to log sanding, deicing, and pesticide spray information.	$80,000	$8,000	ODOT, Klamath Falls	ODOT
I-16	Implement telematics technology on fleet vehicles	Telematics capabilities that can be used to track vehicle performance and vehicle maintenance.	$80,000	$8,000	ODOT, Klamath Falls	ODOT
I-19	Create 9-1-1 Dispatch Interconnect	Connect the 9-1-1 dispatch center with ODOT and OSP through a software update (no construction required). Note that the current BUS to connect such systems is set to be retired but may be joined with Portland system.	$0	$0	Klamath 9-1-1, OSP, ODOT	Klamath 9-1-1
I-20	Develop Traffic Incident Management (TIM) Team	Develop a TIM team for the Klamath County area that includes responders from ODOT, Fire, Tow (OTTA), Law Enforcement, County, Cities, and 911 dispatch. Establish regular meetings and communication with the TIM Team.	$660,000	$66,000	ODOT	ODOT
I-21	Integrate the Intterra Situational Awareness software during incident or emergency response	The software can track where each of the response agencies/vehicles is (en route, at the scene, and during clean up) and improve communication between responders.	$1,220,000	$0	Keno Fire Department, ODOT, OSP	ODOT
I-22	Purchase Portable Variable Message Signs (VMS).	Purchase additional portable VMS to use during events and incidents.	$50,000 (each)	$0	ODOT	
I-25	Real-time transit information and notifications	Provide transit users with real-time information about next arrivals, significant delays, route changes, or other trip related information.	$90,000	$0	Basin Transit	Basin Transit
I-26	Automated transit vehicle on-board data tracking and logging	Install on-board devices to automatically track and log boarding's, de-boardings, use of lift, etc.	$40,000	$0	Basin Transit	Basin Transit
I-27	Provide automated push messages to truck drivers to alert drivers of restrictions (height, weight, length, and width) along route choices.	Such areas include: a) railroad structures on OR39; b) restricted width area on US97 near N Klamath interchange and between Algoma Road and Shady Pine Road.	$110,000	$0	ODOT Motor Carrier	ODOT
I-28	Invest in Real-time freight parking information	Consider the following areas: a) Chiloquin Casino; b) rest area at Midland; c) Pilot Travel center in Chemult	$110,000	$0	ODOT, private partnership	ODOT

Project ID	Project Name	Project Description	Cost Estimate[1]	Expected County Contribution	Funding Partner	Lead Agency
Medium Priority						
I-6	Implement weather responsive variable speed limits on US 97	Install between MP 204-244 and MP 143-164. (Note: ODOT plans for approximately 75% of MP 144-164 to be complete in 2021.)	$8,740,000	$0	ODOT	ODOT
I-7	Create a Central data storage/sharing system	Create a central data storage system that can be shared between agencies. Data may include counts, video, speeds, travel time, etc.	$110,000	$11,000	ODOT	ODOT
I-13	Install sensors that automatically notify agencies and travelers when rock fall occur	Install at US97 near Upper Klamath Lake and add rockslide signs on OR140	$100,000	$0	ODOT	ODOT
I-17	Install Automated Asset Management Tool	Install for the following infrastructure: streetlights, cameras, VMS, and RWIS	$50,000	$5,000	ODOT, Klamath Falls	ODOT
I-18	Purchase software that optimizes snowplow routes and resources	During storm events or adverse weather conditions, software can help to optimize plow routes and distribution of limited resources.	$110,000	$11,000	ODOT, Klamath Falls	ODOT
I-23	Sharing On-Scene Photos and Video	Invest in technology that allows first responders to send and receive photos and video from an incident scene. This can currently be done, but systems should be maintained to stay current with the latest technology.	$10,000	$1,000	ODOT, OSP	ODOT
I-29	Update Klamath County ITS Plan	Update the current ITS Plan to reflect new technologies and completed projects.	$100,000	$0	ODOT	ODOT
Low Priority						
I-8	Install wildlife detection system	Install at: a) US97 MP 174; b) US97 MP 190; c) US97 MP 206	$2,730,000 (approx. $910,000 each)	$0	ODOT	ODOT
I-9	Install dynamic curve speed warning signs on OR66	Dynamic feedback signs can measure the speed of individual vehicles and post messages.	$140,000	$0	ODOT	ODOT
I-14	Variable Speed Limit Study at OR 140 near Lake of the Woods	Conduct a variable speed limit study along OR 140, the Lake of the Woods area.	$100,000	$0	ODOT	ODOT
I-24	Install devices with Automated infrastructure integrity notification capabilities	Install devices that automatically notify responsible agency if infrastructure is damaged. As new infrastructure is built, this strategy should be evaluated on a case by case basis.	$50,000	$5,000	ODOT	ODOT

[1]Cost estimates are preliminary and do not include right-of-way or environmental impacts.
[2]Some elements of these projects are identified in the Draft 2021-2024 Statewide Transportation Improvement Program (STIP).



Klamath County ITS Plan
Existing and Proposed ITS Equipme

Figure
4-5

Figure from Klamath County ITS Plan

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KITTELSON & ASSOCIATES

SAFETY ELEMENTS

The County's Transportation Safety Action Plan (TSAP) identifies countermeasures and prioritizes safety-focused projects to reduce the risk of serious injuries and fatalities related to crashes across the transportations system. The TSAP documents countywide crash trends and patterns on County and state roadways; systemic safety evaluation for top emphasis areas; and network screening. The projects and programs detailed in this chapter reflect intersections and segments identified as high priority locations from the TSAP, review of the most recent 5-years of crash data, and perceived safety concern areas reported by the community and PAC.

Several of the safety-based needs for the County reflect conditions best addressed through education, enforcement, or outreach programs. Others may be addressed through systemic intersection and roadway treatments at specific locations. The type of treatments that could be considered by the County in the future include:

- ROADWAY SAFETY ELEMENTS -, the County should consider the construction of shoulder and guardrails where appropriate, centerline and shoulder rumble strips, recessed or raised pavement markers, edgeline striping, and lane narrowing techniques at key locations along arterials and collectors as part of new roadway construction and maintenance projects.
- SAFETY MONITORING – the County should monitor and periodically analyze collision data and coordinate with City and State agencies as appropriate to address areas with crash rates exceeding commonly used benchmarks.
- SAFE ROUTES TO SCHOOL (SRTS) – the County should seek funding through the State's SRTS programming to fund projects that improve safety near schools and school routes and meet each program's criteria.
- HIGHER ORDER INTERSECTION SAFETY ELEMENTS - The County should implement a standard intersection safety enhancement for higher order intersections (collector/collector or collector/arterial). These could include, but are not limited to, elements such as advanced warning signs, reflective striping and signage, oversized stop signs, double stop signs, stop ahead pavement markers, transverse rumble strips, and edgeline treatments.

Safety Projects

Safety solutions intended to reduce crash frequency, severity, and risk are presented in Table 4-6. These locations are either supported by the County TSAP, historic crash data, a review of current conditions at the site, or identified by members of the public as safety concerns. Several locations have near-, mid-, and/or long-term treatments. The locations with multiple treatments show the planning-level cost opinions and priority level associated with each treatment. In some cases, a low-cost treatment is suggested for near-term consideration, while a long-term, more expensive treatment is also suggested for consideration.

Table 4-6 includes a column for crash history. Crash history was obtained from the ODOT Crash Databased from 2013 to 2017. ODOT provides the types of crashes as well as crash severities, which are grouped into these five categories:

A crash's severity is reported based on the highest injury severity associated with the crash.

Table 4-6 also includes a "safety benefit" column, which estimates the safety benefit of the project based on its Crash Reduction Factor (CRF). A CRF is the percentage of crash reduction that might be expected after implementing a given countermeasure. ODOT has developed a list of approved CRF's that allow projects to be evaluated consistently throughout the state[5]. The ODOT approved CRF is shown in the "safety benefit" column unless further specified.

Several projects in Table 4-6 indicate "systemic signage and striping enhancements." The Federal Highway Administration's (FHWA) *Low-Cost Safety Enhancements for Stop -Controlled and Signalized Intersections* report identifies treatment options that, when used together, help increase visibility and awareness of an intersection. Figure 4-6 shows an example of treatments that may be used together to increase visibility at stop-controlled intersections like those in rural Klamath County. These treatments may be supplemented with stop ahead pavement markings, transverse rumble strips, oversized stop signs, and flashing beacons when appropriate. Figure 4-7 presents the TSP safety solutions.

[5] ODOT Approved CFR list provided at https://www.oregon.gov/ODOT/Engineering/Pages/ARTS.aspx

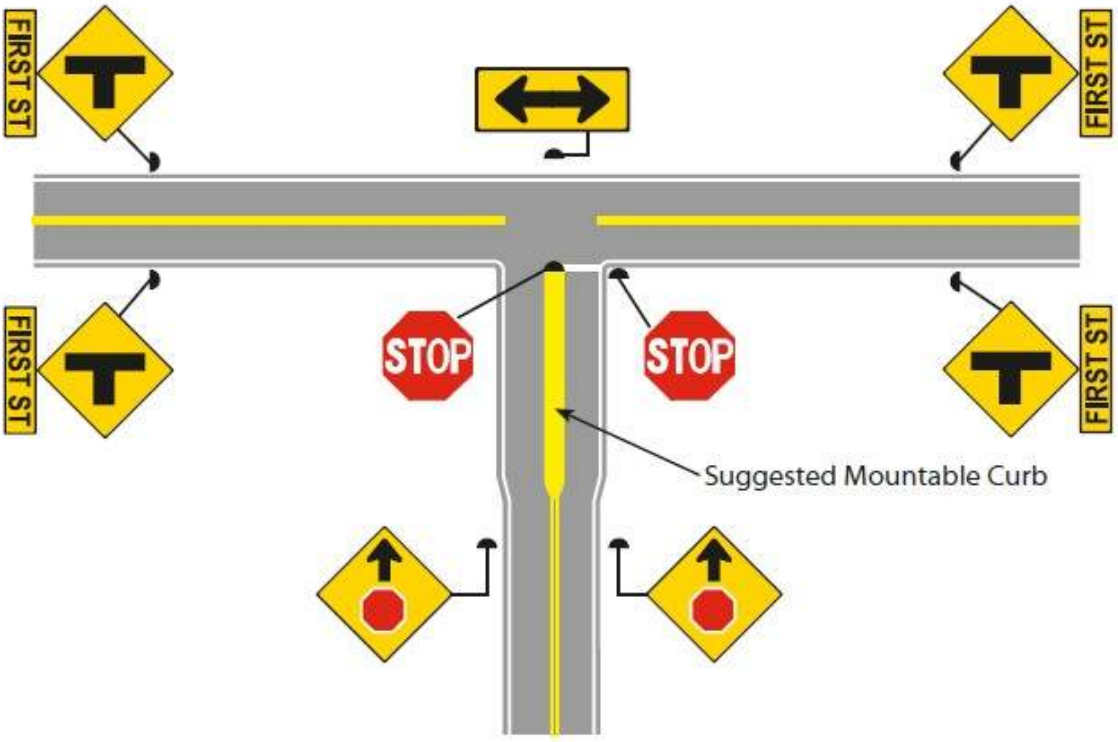


Figure 4-6. Example of Low-Cost Countermeasures for Stop-Controlled Intersections (FHWA)

Table 4-6. Safety Projects

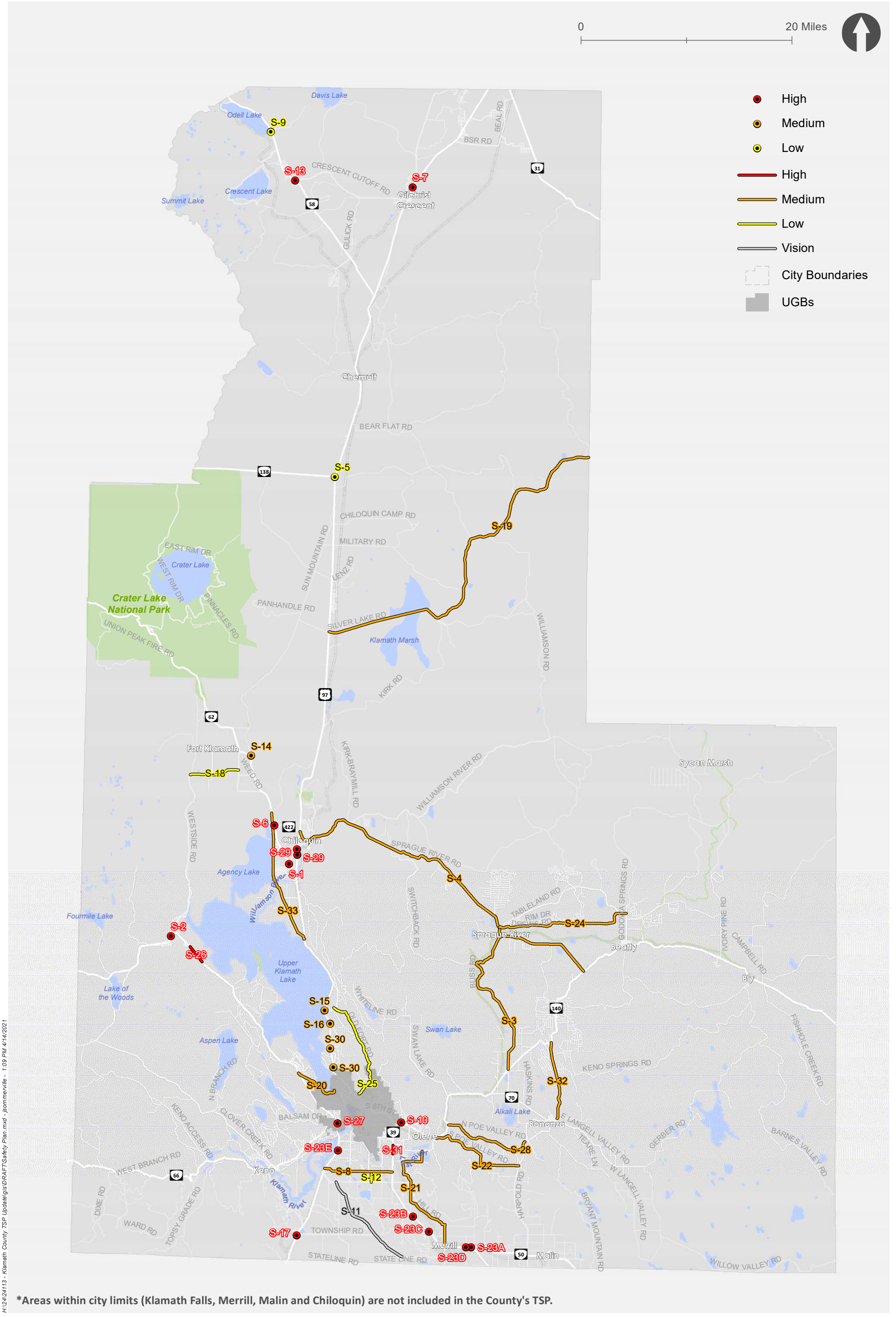
Project ID	Project Name	Project Description	Crash History (Reported 2013 to 2017)	Safety Benefit	Cost Estimate[1]	Expected County Contribution	Funding Partner	Lead Agency
High Priority								
S-1	OR62& Chiloquin Road Intersection Safety Improvement	Near-Term: Install systemic signage and striping enhancements to increase intersection visibility, including stop ahead signs, larger signs, additional stop signs, flashing warning signs, side-street center islands, and/or other intersection warning or regulatory signs. ODOT has planned implementation of these with ARTS funding. Medium-Term: Review sight distance to the north to confirm whether sag curve exists. Long-Term: Complete intersection control improvement to reduce angle and turning movement crashes and to slow speeds.	7 Crashes (1 Injury A, 3 Injury B, 2 Injury C, 1 PDO). 6 of 7 crashes were angle crashes and 1 was a turning movement crash	Near-Term: 25% (I21) Medium Term: N/A Long-Term: N/A	Funded $1,000 $3,000,000	$0 $0 $300,000	ODOT	ODOT
S-2	OR140 & Westside Rd Intersection Safety Improvement	Install systemic signage and striping enhancements to increase intersection visibility, including stop ahead signs, larger signs, additional stop signs, flashing warning signs, side-street center islands, and/or other intersection warning or regulatory signs.	4 Crashes (1 Injury A, 3 PDO). 3 of 4 crashes were turning movement crashes and 1 was a rear-end collision	25% (I21)	$40,000 to $80,000	$0	ODOT	ODOT
S-6	OR62/OR422 Intersection Safety Improvement	Near-Term: Install systemic signage and striping enhancements to increase intersection visibility, including stop ahead signs, larger signs, additional stop signs, flashing warning signs, side-street center islands, and/or other intersection warning or regulatory signs. Evaluate intersection sight distance to determine if Crater Lake sign should be relocated to improve sight distance for westbound vehicles looking north. Medium-Term/Long-Term: Install left-turn lanes on all approaches OR Install roundabout. Note: roundabouts are more costly than constructing turn lanes.	6 Crashes (1 fatal, 1 injury B, 2 injury C, 2 PDO). 5 angle, 1 turning movement crash	Near Term - 25% (I21) Med/Long (Turn Lanes) - 48% (H10) Med/Long (Roundabout) - 82%	Near-Term: $40,000 to $80,000 Long-Term (Roundabout): $4,000,000	$0	ODOT	ODOT
S-7	Mississippi Drive/US97 Intersection Safety Improvement	Install southbound left-turn lane; Consider gateway feature and/or cross-section changes, as well as extending the existing multi-use path along US 97 to Mississippi Drive to "urbanize" the corridor in the Gilchrist area. Features may include curb, raised median, landscaping, illumination, etc.	2 Crashes (2 injury A). 1 turning movement, 1 rear end crash	Left Turn Lane - 44% (H9)	$300,000 for turn lane	$0	ODOT	ODOT
S-10	Vale Road & OR140 Intersection Safety Improvement	Increase sight distance for northbound vehicles to the west by removing tree. Increase intersection awareness with larger stop signs and pavement markings.	5 Crashes (1 injury A, 1 injury B, 1 injury C). 2 turning movement, 2 rear end, 1 angle crash	Systemic Improvements - 25 % (I21) Sight Distance - 48% (I17)	$30,000	$0	ODOT	ODOT
S-13	Crescent Cutoff Road/OR58 Intersection Safety Improvement	Near-Term: Install systemic signage and striping enhancements to increase intersection visibility, including stop ahead signs, larger signs, additional stop signs, flashing warning signs, side-street center islands, and/or other intersection warning or regulatory signs. Medium-Term: Conduct a corridor safety study for Crescent Cutoff Road to determine site-specific safety issues along the roadway.	5 Crashes (1 injury B, 1 injury C, 3 PDO). 2 fixed object, 2 miscellaneous, 1 turning movement crash	Near Term - 25% (I21) Medium Term - N/A	Near-Term: $40,000 to $80,000 Medium-Term: $50,000	$0	ODOT	ODOT
S-17	US97/Keno Worden Rd Intersection Safety Improvement	Increase intersection awareness with signing and striping. Add northbound left-turn lane and eastbound right-turn acceleration lane to support freight route.	1 Crash (PDO) caused by a turning movement collision	Systemic Improvements - 25 % (I21) Left Turn Lane - 44% (H9)	$340,000	$0	ODOT	ODOT

Project ID	Project Name	Project Description	Crash History (Reported 2013 to 2017)	Safety Benefit	Cost Estimate[1]	Expected County Contribution	Funding Partner	Lead Agency
				Acceleration Lane - 45% (H28)				
S-23	Intersection Systemic Sign Upgrades	Install systemic signage and striping enhancements to increase intersection visibility, including stop ahead signs, larger signs, additional stop signs, flashing warning signs, side-street center islands, and/or other intersection warning or regulatory signs. Part of an ODOT STIP Project including locations at: a) OR39/ Malin Highway b) OR39/ Chin Road c) OR39/ Merrill Pit Road d) OR39/ Malone Road e) US97/ Sawmill Road	14 Total Crashes (5 injury B, 5 injury C, 4 PDO). 4 fixed object, 4 turning movement, 4 rear-end, 1 sideswipe, 1 angle crash	25% (I21)	$240,000 to $480,000 (approx. $40,000 to $80,000 each)	$24,000 (approx. $4,000 each) to $48,000 (approx. $8,000 each)	ODOT	ODOT
S-26	OR 140 Corridor Safety Improvement	Improve clear zone on OR140 from Mile Post 46.25 to 48.25	9 Crashes (2 injury C, 7 PDO). 2 fixed object, 3 animal, 1 sideswipe, 1 overturned, 1 head-on, 1 miscellaneous crash	Sight Distance - 48% (I17)	$520,000	$0	ODOT	ODOT
S-27	Delap Pit Road Realignment	Phase 3 of the Greensprings IAMP. Realign Delap Pit Road to connect with the realigned OR 140 approximately 1/4 mile from OR66	No Crash Data	N/A	$3,000,000	$300,000	ODOT	ODOT
S-29	S Chiloquin Road Curve Safety Improvement	Install guardrail on two curves just west of US97. Install chevrons and delineators on curves.	2 Crashes (1 fatal, 1 PDO). 2 fixed object crashes	Guardrail - 47% (RD26) Chevron Signs - 16% (RD6) Delineators - 30% Night (RD14)	$93,000	$93,000	-	County
S-31	Henley School Area Safety Improvements	Increase school zone awareness with flashing signs, updated pavement legends and pavement markings. Conduct a school circulation study including intersection evaluations at the school access points and OR39/Henley Road and a Safe Routes to School Plan. Fill in sidewalk gaps with ADA sidewalk and curb ramps approaching crossings.	11 Crashes (1 injury B, 2 injury C, 8 PDO). 4 fixed object, 4 rear-end, 2 animal, 1 turning movement crash	25% (I21)	$200,000	$20,000	ODOT, Klamath County School District	ODOT
Medium Priority								
S-3	Bliss Road Corridor Safety Improvement: OR140 to Sprague River Road	Widen roadway shoulders to at least 6 feet [cost for shoulders included in B-6]; Install shoulder rumble strips; Install speed feedback signs throughout key locations within corridor; Increase speed enforcement and outreach/education throughout corridor. Evaluate opportunities to improve visibility at intersections, driveways, and curves by increasing reflectivity. Install chevrons and delineators at curves.	10 Crashes (1 Fatal, 1 Injury A, 1 Injury B, 2 Injury C, 5 PDO). 5 fixed object, 1 angle, 2 miscellaneous, 1 sideswipe, 1 turning movement crash.	Shoulder widening - 18% (RD22) Shoulder rumble strips - 22% (RD18) Speed feedback signs - 10% (RD12) Delineators - 30% Night (RD14) Reflective Signs - 20% (RD8)	$16,730,00 (shoulder widening from solution B-6) $80,000 (all other S-3 treatments)	$80,000	-	County
S-4	Sprague River Road Corridor Safety Improvement: OR140 to US97	Widen roadway shoulders to at least 6 feet [cost for shoulders included in B-7]; Install shoulder rumble strips; Install speed feedback signs throughout key locations within corridor, including one at MP 13; Increase speed enforcement and outreach/education throughout corridor. Evaluate opportunities to improve visibility at intersections, driveways, and curves by increasing reflectivity. Install chevrons and delineators at curves.	33 Crashes (1 Fatal, 2 Injury A, 9 Injury B, 8 Injury C, 13 PDO). 20 fixed object, 12 miscellaneous, 1 sideswipe crash.	Shoulder widening - 18% (RD22) Shoulder rumble strips - 22% (RD18) Speed feedback signs - 10% (RD12)	$26,570,000 (shoulder widening from solution B-7) $183,000 (all other S-4 treatments)	$183,000	-	County

Project ID	Project Name	Project Description	Crash History (Reported 2013 to 2017)	Safety Benefit	Cost Estimate[1]	Expected County Contribution	Funding Partner	Lead Agency
				Delineators - 30% Night (RD14) Reflective Signs - 20% (RD8)				
S-8	Old Midland Road	Install chevrons and delineators at curves between US 97 and OR 39.	7 Crashes (2 injury B, 2 injury C, 3 PDO). 2 fixed object, 2 miscellaneous, 1 turning movement, 1 rear end, 1 head on crash	Chevron Signs - 16% (RD6) Delineators - 30% Night (RD14)	$6,000	$6,000	-	County
S-14	Sun Mountain Road/OR62 Intersection Safety Improvement	Install systemic signage and striping enhancements to increase intersection visibility, including stop ahead signs, larger signs, additional stop signs, flashing warning signs, side-street center islands, and/or other intersection warning or regulatory signs.	4 Crashes (2 injury A, 1 injury B, 1 PDO). 2 fixed object, 2 overturn crashes	25% (I21)	$40,000 to $80,000	$0	ODOT	ODOT
S-15	US97/Algoma Rd Intersection Safety Improvement	Install flashing intersection ahead warning sign on US97, south of the southern intersection. Consider one that detects vehicles waiting on the side-street approach.	2 crashes (1 injury C, 1 PDO). 1 fixed object, 1 rear end crash	13% (I15)	$500,000	$0	ODOT	ODOT
S-16	US97/Shady Pine Road Intersection Safety Improvement	Realign northern intersection to reduce skew. Evaluate opportunities to improve sight distance at southern intersection.	No Crash Data	Skew Angle - 10-20% (H60) Sight Distance - 48% (I17)	$100,000	$0	ODOT	ODOT
S-19	Silver Lake Road Corridor Safety Improvement	Install chevrons and delineators on curves from US97 to County Limits; Install speed feedback signs and increase speed enforcement	7 Crashes (1 fatal, 1 injury A, 1 injury B, 1 injury C, 3 PDO). 3 fixed object, 3 animal, 1 overturned crash	Chevron Signs - 16% (RD6) Delineators - 30% Night (RD14) Speed feedback signs - 10% (RD12)	$210,000	$21,000	ODOT	ODOT
S-20	Lakeshore Drive Corridor Safety Improvement	Install chevrons and delineators on curves from OR140 to Klamath Falls UGB; Target winter maintenance at curves on hills where crashes occurred in snow/ice	7 Crahses (2 injury A, 2 injury C, 3 PDO). 6 fixed object, 1 rear end crash	Chevron Signs - 16% (RD6) Delineators - 30% Night (RD14)	$110,000	$11,000	-	County
S-21	Hill Road Corridor Safety Improvement	Install chevrons and delineators on curves from Crystal Springs Road to Merrill City Limits	16 Crashes (1 injury A, 2 injury B, 1 injury C, 12 PDO). 9 fixed object, 3 animal, 1 turning movement, 2 sideswipe, 1 overturned	Chevron Signs - 16% (RD6) Delineators - 30% Night (RD14)	$110,000	$11,000	ODOT	ODOT
S-22	S Poe Valley Rd Corridor Safety Improvement	Install chevrons and delineators on curves from Harpold Road to Crystal Springs Road	7 Crashes (1 injury A, 1 injury B, 1 injury C, 4 PDO). 5 fixed object, 1 overturned, 1 animal	Chevron Signs - 16% (RD6) Delineators - 30% Night (RD14)	$110,000	$11,000	ODOT	ODOT
S-24	Drews Road Safety Improvements	Install chevrons and/or delineators along horizontal curves to address public concern with roadway safety.	2 Crashes (2 injury A). 1 rear-end, 1 sideswipe crash	Chevron Signs - 16% (RD6) Delineators - 30% Night (RD14)	$9,000	$9,000	-	County
S-28	North Poe Valley Road Safety Improvement	Install chevrons and/or delineators along horizontal curves with curves to address public concern with roadway safety.	13 Crashes (3 injury B, 5 injury C, 5 PDO). 8 fixed object, 2 turning movement, 2 overturned, 1 rear-end crash	Chevron Signs - 16% (RD6)	$15,000	$15,000	-	County

Project ID	Project Name	Project Description	Crash History (Reported 2013 to 2017)	Safety Benefit	Cost Estimate[1]	Expected County Contribution	Funding Partner	Lead Agency
				Delineators - 30% Night (RD14)				
S-30	US97/Wocus Road Intersection Safety Improvement and Roadway Realignment	Convert both existing intersections to right-in, right-out only; Construct new roadway connection at Cove Point Road	"North intersection - 3 Crashes (2 injury C, 1 PDO). 1 fixed object, 1 animal, 1 sideswipe crash South intersection - 2 Crashes (1 injury B, 1 injury C). 1 angle, 1 overturned crash"	35% (H6)	$1,600,000	$0	ODOT	ODOT
S-32	Bly Mountain Cut-Off Road	Install chevrons and delineators at curves between OR 140 and McCartie Lane.	4 Crashes (1 injury B, 1 injury C, 2 PDO). 3 fixed object, 1 animal crash	Chevron Signs - 16% (RD6) Delineators - 30% Night (RD14)	$14,000	$14,000	-	County
S-33	Modoc Point Road	Install chevrons and delineators at curves between OR 62 and US 97.	16 Crashes (5 PDO). 7 fixed object, 4 turning movement, 2 overturned, 2 animal, 1 miscellaneous	Chevron Signs - 16% (RD6) Delineators - 30% Night (RD14)	$8,000	$8,000	-	County
Low Priority								
S-5	US97/OR138 Intersection Safety Improvement	Define access point(s) along eastern edge of intersection. Property is currently open which may be associated with unclear driver expectations	19 Crashes (2 fatal, 8 Injury B, 4 Injury C, 5 PDO). 7 fixed object, 3 miscellaneous, 1 angle, 2 rear end, 1 sideswipe, 4 turning movement, 1 head on crash	N/A	$100,000	$0	ODOT	ODOT
S-9	East Odell Road/OR58 Intersection Safety Improvement	Evaluate curve for appropriate curve signage and delineation including chevrons, post delineators, and curve warning signs. Increase intersection awareness with signing and pavement markers.	4 Crashes (1 injury A, 1 injury B, 1 injury C, 1 PDO). 3 fixed object, 1 sideswipe crash	25% (I21)	$10,000	$0	ODOT	ODOT
S-12	Spring Lake Road Corridor Safety Improvement: Old Midland Road to Cross Road	Install speed feedback signs and increase speed enforcement	1 Crash (PDO) caused by an animal collision	Speed feedback signs - 10% (RD12)	$50,000	$50,000	-	County
S-18	Seven Mile Road between Westside Road and Weed Road	Install recommended Chevron signs on horizontal curves; Install centerline rumble strips. Install speed feedback signs and increase speed enforcement1	1 Crash (fatal) from a head-on collision	Chevron Signs - 16% (RD6) Centerline Rumble Strips - 12% (RD16) Speed feedback signs - 10% (RD12)	$50,000	$50,000	-	County
S-25	Old Fort Road Safety Improvement	Install centerline rumble strips from Loma Linda Drive to the pavement end to reduce risk of crossing crashes.	9 Crashes (1 injury A, 4 injury B, 2 injury C). 6 fixed object, 2 overturned, 1 head-on crash	Centerline Rumble Strips - 12% (RD16)	$9,000	$9,000	-	County
Vision								
S-11	Lower Klamath Road between Cross Rd and Township Rd	Widen roadway shoulders to at least 6 feet; Install shoulder rumble strips; Install speed feedback signs; Increase speed enforcement and outreach/education throughout corridor.	6 Crashes (2 injury B, 2 injury C, 2 PDO). 5 fixed object, 1 animal crash	Shoulder widening - 18% (RD22) Shoulder rumble strips - 22% (RD18) Speed feedback signs - 10% (RD12)	-	-	-	-

[1]Cost estimates are preliminary and do not include right-of-way or environmental impacts.



*Areas within city limits (Klamath Falls, Merrill, Malin and Chiloquin) are not included in the County's TSP.

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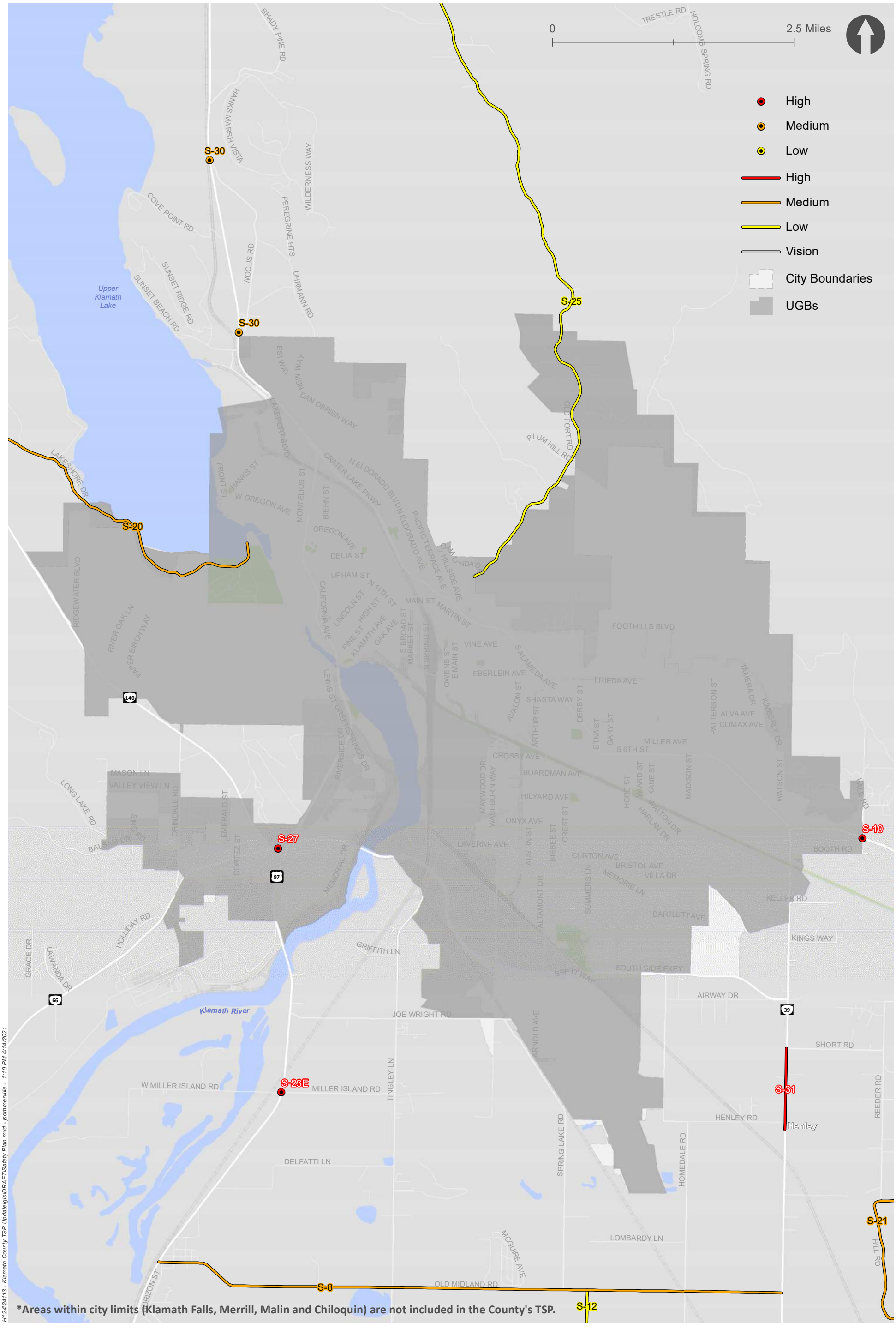
Safety Plan
Klamath County, Oregon

Figure
4-7A

KITTELSON & ASSOCIATES

Data Source: ODOT (Statewide Freight Routes)



*Areas within city limits (Klamath Falls, Merrill, Malin and Chiloquin) are not included in the County's TSP.

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Safety Plan
Klamath County, Oregon

Figure
4-7B

KITTELSON & ASSOCIATES

Data Source: ODOT (Statewide Freight Routes)

BRIDGE ELEMENTS

The County owns and maintains 205 bridges.

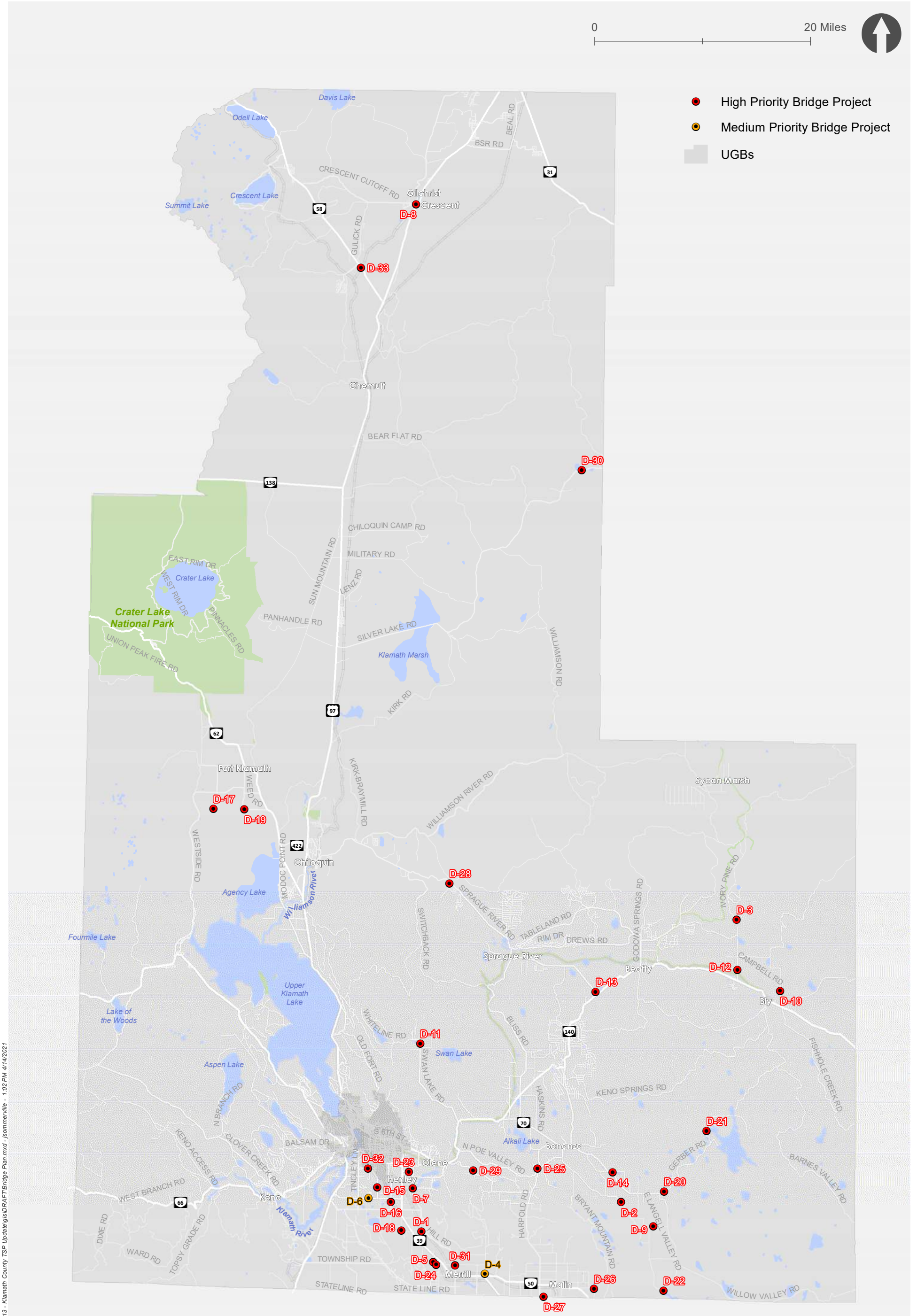
Bridges are a critical element to the County's transportation system as they support motor vehicle transport, especially freight movement, and the overall economy in Klamath County, south central Oregon, and the entire state. The County owns and maintains 205 bridges, including those located in the UGBs. A variety of bridges exist in the County such as concrete/timber slab, concrete/timber stringer/girder, concrete box beam, and steel/concrete culvert. To keep this critical infrastructure functioning, the County manages an extensive bridge maintenance database of current bridge conditions and ratings as well as a 10-year bridge replacement and rehabilitation plan. These bridges are included in the bridge projects presented in Table 4-7; the priorities assigned to these bridge projects reflect their priorities in the 10-year plan. Provided that the TSP horizon continues beyond the County's 10-year bridge replacement and rehabilitation plan, the bridge projects in Table 4-7 also include rehabilitating or replacing bridges that are identified as being structurally deficient. Bridge projects are shown in Figure 4-8.

Table 4-7. Bridge Projects

Project ID	Project Name	Project Description	Cost Estimate[1]	Expected County Contribution	Funding Partner	Lead Agency
High Priority						
D-1	Bridge Rehabilitation at Matney Way (Lost River) Bridge ID: 35C211	Structural Deficiency	$690,000	$690,000	-	County
D-2	Bridge Replacement at W Langell Valley Rd (Irrigation canal) Bridge ID: 18C011	Structural Deficiency	$260,000	$260,000	-	County
D-3	Bridge Rehabilitation at Ivory Pine Rd (Meryl Creek) Bridge ID: 35C223	Structural Deficiency	$280,000	$,000	-	County
D-5	Bridge Rehabilitation at I O O F Cemetery Rd (Irrigation canal) Bridge ID: 35C145	Structural Deficiency	$390,000	$390,000	-	County
D-7	Bridge Rehabilitation Study at Reeder Road (Lost River) Bridge ID: 8105	10-year Bridge Rehab/ Replace Project List	$50,000	$50,000	-	County
D-8	Bridge Rehabilitation at Crescent Cutoff Road (Little Deschutes River) Bridge ID: 9027	10-year Bridge Rehab/ Replace Project List	$110,000	$110,000	-	County
D-9	Bridge Rehabilitation at Gift Road (Lost River) Bridge ID: 18C26A	10-year Bridge Rehab/ Replace Project List	$520,000	$520280,000	-	County
D-10	Bridge Replacement at Cambell Road (Ditch) Bridge ID: 35C117	10-year Bridge Rehab/ Replace Project List	$360,000	$360,000	-	County
D-11	Bridge Replacement at Swan Lake Road (Drainage Ditch) Bridge ID: 35C197	10-year Bridge Rehab/ Replace Project List	$270,000	$270,000	-	County
D-12	Bridge Replacement at Ivory Pine Road (S Sprague River) Bridge ID: 35C219	10-year Bridge Rehab/ Replace Project List	$1,070,000	$1,070,000	-	County
D-13	Bridge Replacement at Sprague River Road (Whiskey Creek) Bridge ID: 18C009	10-year Bridge Rehab/ Replace Project List	$250,000	$250,000	-	County
D-14	Bridge Replacement at Langell Valley Road (Lost River) Bridge ID: 18C017	10-year Bridge Rehab/ Replace Project List	$1,640,000	$1,640,000	-	County
D-15	Bridge Rehabilitation at Spring Lake Road (Drain Ditch) Bridge ID: 18C020	10-year Bridge Rehab/ Replace Project List	$390,000	$390,000	-	County
D-16	Bridge Replacement at Homedale Road (Irrigation Canal) Bridge ID: 35C143	10-year Bridge Rehab/ Replace Project List	$290,000	$290,000	-	County
D-17	Bridge Rehabilitation at McQuiston Road (Seven Mile Canal) Bridge ID: 35C154	10-year Bridge Rehab/ Replace Project List	$760,000	$760,000	-	County
D-18	Bridge Replacement Matney Road (Irrigation Canal) Bridge ID: 35C157	10-year Bridge Rehab/ Replace Project List	$380,000	$380,000	-	County
D-19	Bridge Replacement at Weed Road (Wood River) Bridge ID: 35C206	10-year Bridge Rehab/ Replace Project List	$1,150,000	$1,150,000	-	County
D-20	Bridge Rehabilitation at Gerber Road (Irrigation Canal) Bridge ID: 35C217	10-year Bridge Rehab/ Replace Project List	$100,000	$100,000	-	County
D-21	Bridge Replacement at Gerber Road (Ben Hall Creek) Bridge ID: 35C218	10-year Bridge Rehab/ Replace Project List	$450,000	$450,000	-	County
D-22	Bridge Replacement at Langell Valley Road (Lost River) Bridge ID: 8592	10-year Bridge Rehab/ Replace Project List	$1,540,000	$1,540,000	-	County
D-23	Bridge Replacement at Short Road (Canal) Bridge ID: 18C21A	10-year Bridge Rehab/ Replace Project List	$960,000	$960,000	-	County
D-24	Bridge Rehabilitation at Anderson Road (Irrigation Canal) Bridge ID: 35C146	10-year Bridge Rehab/ Replace Project List	$220,000	$220,000	-	County
D-25	Bridge Replacement at Poe Valley Road (Harpold Dam-Lost River) Bridge ID: 35C168	10-year Bridge Rehab/ Replace Project List	$870,000	$870,000	-	County
D-26	Bridge Rehabilitation at Holl Road (Low Line Canal) Bridge ID: 35C186	10-year Bridge Rehab/ Replace Project List	$80,000	$80,000	-	County
D-27	Bridge Replacement at Stateline Road (J-11 Lateral) Bridge ID: 35C193	10-year Bridge Rehab/ Replace Project List	$190,000	$190,000	-	County
D-28	Bridge Replacement at Saddle Mount Pit Road (Sprague River)	10-year Bridge Rehab/ Replace Project List	$990,000	$990,000	-	County

Project ID	Project Name	Project Description	Cost Estimate[1]	Expected County Contribution	Funding Partner	Lead Agency
	Bridge ID: 35C225					
D-29	Bridge Replacement at Poe Valley Road (F Canal) Bridge ID: 35C351	10-year Bridge Rehab/ Replace Project List	$130,000	$130,000	-	County
D-30	Bridge Replacement at Silver Lake Road (Cattle Pass) Bridge ID: 35C354	10-year Bridge Rehab/ Replace Project List	$160,000	$160,000	-	County
D-31	Bridge Replacement at Hill Road (Irrigation Canal) Bridge ID: 35C138	10-year Bridge Rehab/ Replace Project List	$240,000	$240,000	-	County
D-32	Bridge Replacement at Joe Wright Road (A-3 Irrigation) Bridge ID: 35C215	10-year Bridge Rehab/ Replace Project List	$250,000	$250,000	-	County
D-33	Bridge Replacement at OR58 (Railroad MP 82.4) Bridge ID: 02452A	2010 Klamath County TSP	$6,820,000	$0	ODOT, Klamath Northern Rail	ODOT
Medium Priority						
D-4	Bridge Rehabilitation at Dodds Hollow (Irrigation canal) Bridge ID: 35C124	Structural Deficiency	$470,000	$470,000	-	County
D-6	Bridge Rehabilitation at Washburn Way (Irrigation canal) Bridge ID: 35C342	Structural Deficiency	$460,000	$460,000	-	County

[1]Cost estimates are preliminary and do not include right-of-way or environmental impacts.



*Areas within city limits (Klamath Falls, Merrill, Malin and Chiloquin) are not included in the County's TSP.

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Bridge Plan
Klamath County, Oregon

Figure **4-8A**

KITTELSON & ASSOCIATES

Data Source: ODOT (Statewide Freight Routes)

0 2.5 Miles

High Priority Bridge Project

Medium Priority Bridge Project

UGBs

D-32 D-23 D-15 D-7 D-6 D-16

*Areas within city limits (Klamath Falls, Merrill, Malin and Chiloquin) are not included in the County's TSP.

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Bridge Plan
Klamath County, Oregon

Figure **4-8B**

KITTELSON & ASSOCIATES

Data Source: ODOT (Statewide Freight Routes)

Source: ODOT

BICYCLE AND PEDESTRIAN PLAN

In rural Klamath County, people walking, biking, and rolling generally share the same facilities. Unlike urbanized areas – where people biking use designated lanes or wide shoulders and people walking or rolling use sidewalks – rural facilities for non-motorized travel usually consist of wide shoulders and/or multi-use paths. As in most rural areas, the needs of people walking, biking, and rolling are similar. Facilities that are deficient for one user are usually deficient for the others, thus recommended improvements can benefit more than one user.

The projects presented in Table 4-8 to Table 4-9 and Figure 4-9 to Figure 4-10 represent the County's current priorities for facilities that support people biking, walking, and rolling. These projects are intended to provide a designated space for people walking and rolling in the rural unincorporated areas to access local destinations and provide continuity for people walking, biking, and rolling to move more freely throughout Klamath County and access regional destinations. Facilities for people walking, biking, and rolling also serve as connections to transit services where available, which can provide transportation to destinations within and beyond the county. Many of the projects include widening

shoulders or installing shared use paths for long stretches of several roadways. This type of improvement tends to be high cost, so most of these projects are visionary.

Table 4-8. Bicycle Projects

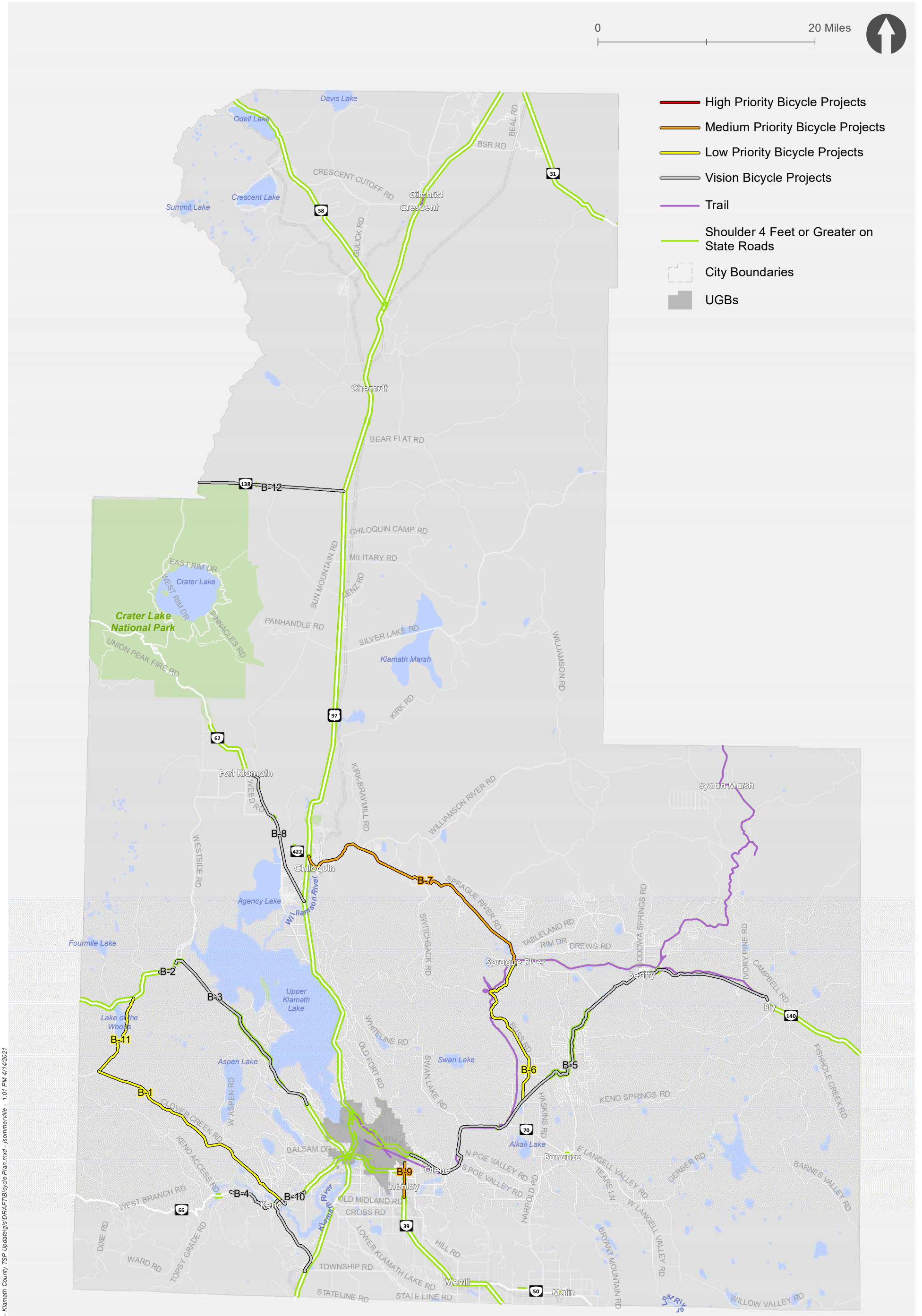
Project ID	Project Name	Project Description	Cost Estimate[1]	Expected County Contribution	Funding Partner	Lead Agency
Medium Priority						
B-7	Install bicycle facility on Sprague River Road	Widen shoulders or install shared use path where they are less than 6 feet on Sprague River Road between Bliss Road and US97	$26,570,000	$26,570,000	-	County
B-9	Install bicycle facility on OR39	Near-Term: Widen shoulders or install shared use path where they are less than 6 feet on OR39 Klamath Falls UGB and Roberta Drive Medium-Term: Install dedicated facility such as bike lanes, buffered bike lanes, or shared-use path.	Near-Term: $3,350,000 Medium-Term: $5,000,000 (Buffered Bike Lane Estimate)	$0	ODOT	ODOT
Low Priority						
B-1	Install bicycle facility on Clover Creek Road	Widen shoulders or install shared use path where they are less than 6 feet on Clover Creek Road between OR66 and Dead Indian Road	$21,470,000	$21,470,000	-	County
B-6	Install bicycle facility on Bliss Road	Widen shoulders or install shared use path where they are less than 6 feet on Bliss Road between Sprague River Road and OR140	$16,730,000	$16,730,000	-	County
B-11	Install bicycle facility on Dead Indian Road	Widen shoulders or install shared use path where they are less than 6 feet on Dead Indian Road between Clover Creek Road and OR140	$8,460,000	$8,460,000	-	County
Vision						
B-2	Install bicycle facility on OR140 west of Westside Road	Widen shoulders or install shared use path where they are less than 6 feet on OR140 between Greylock Way and FR 3610	-	-	ODOT	ODOT
B-3	Install bicycle facility on OR140 east of Westside Road	Widen shoulders or install shared use path where they are less than 6 feet on OR140 between Westside Road and Lakeshore Drive	-	-	ODOT	ODOT
B-4	Install bicycle facility on OR66 and Keno Worden Road	Widen shoulders or install shared use path where they are less than 6 feet on OR66 and Keno Worden Road between Bill Scholter Sportsman Park and US97	-	-	ODOT	ODOT
B-5	Install bicycle facility on OR140 east of Klamath Falls UGB	Widen shoulders or install shared use path where they are less than 6 feet on OR140 between Klamath Falls UGB and Bly	-	-	ODOT	ODOT
B-8	Install bicycle facility on OR62	Widen shoulders or install shared use path where they are less than 6 feet on OR62 between US97 and Fort Klamath	-	-	ODOT	ODOT
B-10	Install bicycle facility on OR66 and Keno Worden Road	Widen shoulders or install shared use path where they are less than 6 feet on OR66 between Kern Swamp Road and River Road	-	-	ODOT	ODOT
B-12	Install bicycle facility on OR138	Widen shoulders or install shared use path on OR138 (Adventure Cycling Route) from US97 to County limit where paved shoulder width is less than 6 feet.	-	-	ODOT	ODOT

[1]Cost estimates are preliminary and do not include right-of-way or environmental impacts.

Table 4-9. Pedestrian Projects

Project ID	Project Name	Project Description	Cost Estimate[1]	Expected County Contribution	Funding Partner	Lead Agency
High Priority						
P-1	Enhanced crossing on OR140 at OC&E Trail – Bly	Near-Term: Install signage and striping enhancements to increase intersection visibility, including larger signs, crossing markings, additional trail ahead signs, and/or other intersection warning or regulatory signs. Medium-Term/Long-Term: Install an enhanced crossing.	$80,000	$0	ODOT	ODOT
P-3	Install mid-block crossing on Chiloquin Hwy	Install crossing between the Tribal Administration Building and the Wellness Center	$710,000	$71,000	Klamath Tribe	Klamath Tribes
P-4	Resurface shared-use path on OR140 in Bly	Resurface path from Fire Station to Edsall Street	$330,000	$0	ODOT	ODOT
P-7	Construct sidewalk on southside of OR140 in Beatty	Construct sidewalk on southside of OR140 between Yellow Jacket Springs Road and Hutchinson Road	$40,000	$0	ODOT	ODOT
P-9	Construct sidewalk on OR66 in Keno	Construct sidewalk on both sides of OR66 between Needle Dam Road and River Street	$460,000	$0	ODOT	ODOT
P-11	Construct sidewalk on US97 in Chemult	Construct sidewalk on the west side of US97 between Fire Station and 900 feet south of 1st Street	$305,000	$0	ODOT	ODOT
P-12	Enhanced crossing on OR140 at OC&E Trail – Olene	Near-Term: Install signage and striping enhancements to increase intersection visibility, including larger signs, crossing markings, additional trail ahead signs, and/or other intersection warning or regulatory signs. Medium-Term/Long-Term: Install an enhanced crossing.	$80,000	$0	ODOT	ODOT
P-13	ADA ramp installation program	Program to install ADA ramps where they are missing or improve ramps where they are in poor condition	$200,000 ($10,000 annually)	$200,000 ($10,000 annually)	-	County
Medium Priority						
P-2	Construct shared-use path on Chiloquin Hwy	Between US97 and OR422	$4,370,000	$437,000	Klamath Tribes	Klamath Tribes
P-5	Construct shared-use path from OR140 to Community School in Bly	Construct path on westside of the CR504 and Metler Street	$450,000	$45,000	ODOT	ODOT
P-8	Construct sidewalk in Sprague River	Construct sidewalk on both sides of Sprague River Road between Main Street (N) and Main Street (S)	$170,000	$170,000	N/A	County
P-6	Enhanced crossing on US 97 in Crescent	Near-Term: Conduct a pedestrian crossing study Medium-Term/Long-Term: Construct enhanced pedestrian crossing per pedestrian crossing study recommendation	Near-Term: $25,000 Medium-Term: $500,000	$0	ODOT	ODOT
P-14	Enhanced crossing on US 97 in Chemult	Near-Term: Conduct a pedestrian crossing study Medium-Term/Long-Term: Construct enhanced pedestrian crossing per pedestrian crossing study recommendation	Near-Term: $25,000 Medium-Term: $500,000	$0	ODOT	ODOT
Low Priority						
P-10	Construct sidewalk on Keno Worden Road	Construct sidewalk on both sides of Keno Worden Road between OR66 and Folley Lane	$370,000	$370,000	-	County

[1]Cost estimates are preliminary and do not include right-of-way or environmental impacts.



*Areas within city limits (Klamath Falls, Merrill, Malin and Chiloquin) are not included in the County's TSP. Existing Facilities within the Klamath Falls UGB were not verified.

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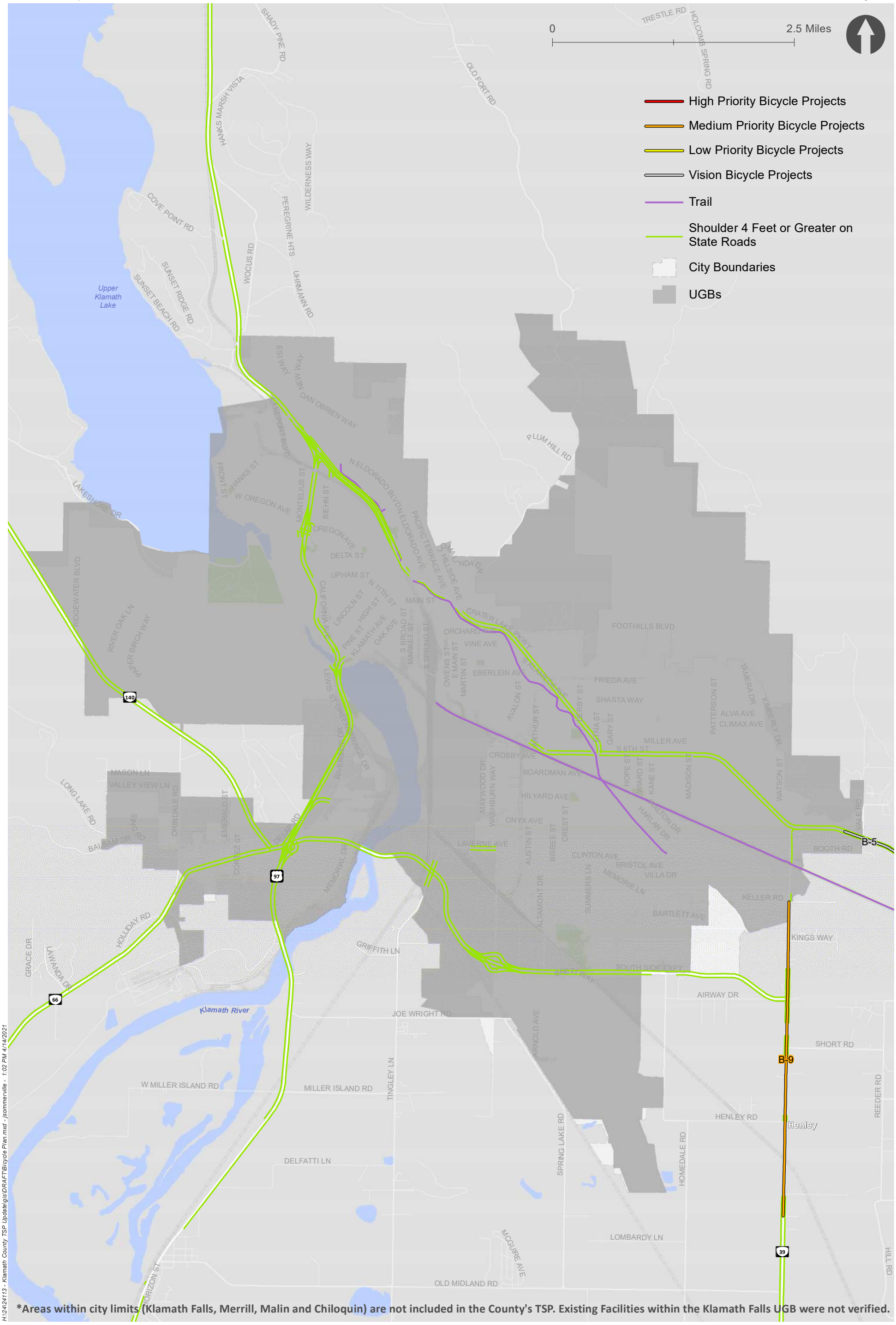
Bicycle Plan
Klamath County, Oregon

Figure **4-9A**

KITTELSON & ASSOCIATES

Data Source: ODOT (Statewide Freight Routes)



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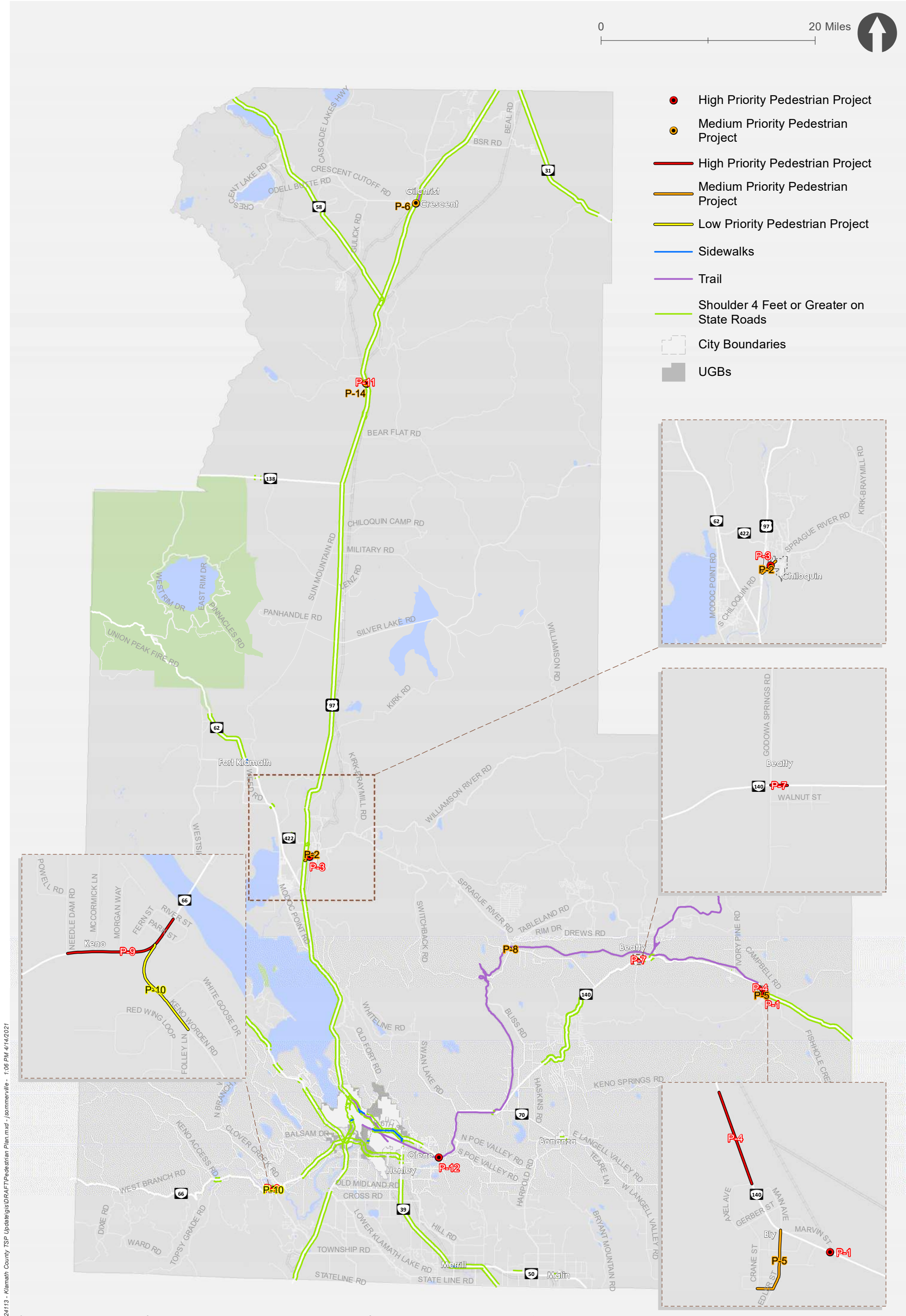
Bicycle Plan
Klamath County, Oregon

Figure **4-9B**

KITTELSON & ASSOCIATES

Data Source: ODOT (Statewide Freight Routes)



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Pedestrian Plan
Klamath County, Oregon

Figure **4-10**

KITTELSON & ASSOCIATES

Source: ODOT

TRANSIT PLAN

The provision of high-quality, available, and reliable transit service fundamentally supports the environment, economic development, and equity for all travelers. Public transit is an important transportation option for people that cannot afford, do not choose, or are unable to drive or bike. Public transit can also complement walking, biking, and/or driving trips: transit riders typically need to use another mode for the "first and last mile" of their trip – the connections between their origin/transit stop and destination/transit stop. Transit riders may walk to and from transit stops and their homes, shopping, or workplaces; drive to park-and-ride locations to access a bus; or bring their bikes on transit vehicles and ride from a transit stop to their destination.

> Public transit is an important transportation option for people that cannot afford, do not choose, or are unable to drive or bike.

Several transit providers operate within Klamath County as either intercounty/intercity services or as regional services that connect riders to adjacent counties such as Deschutes

and Jackson. These transit providers and their services include:

- **Basin Transit Service**: fixed-route services in Klamath Falls and dial-a-ride service within the UGB
- **Quail Trail Public Transit** (operated by the Klamath Tribes): fixed routes between Chiloquin and other cities/communities such as Klamath Falls, Sprague River, Beatty, and Bonanza
- **Amtrak Thruway** (operated by Pacific Crest Bus lines): service between Chemult and Deschutes County, which connects to the Amtrak train station in Chemult
- **Amtrak Rail**: passenger rail service along the west coast with two train stations in Klamath County: Chemult and Klamath Falls
- **SouthWest POINT** (operated under contract by ODOT): intercity bus service west of Klamath Falls (identified as "Klamath Falls – West, just outside the UGB) with connections to Ashland, Medford, and the northern California and southern Oregon coastlines

Table 4-10 summarizes the transit program recommendations. Additional technology related transit programs and solutions are presented in Table 4-5 and the *Klamath County ITS Plan*.

Table 4-10. Transit Projects

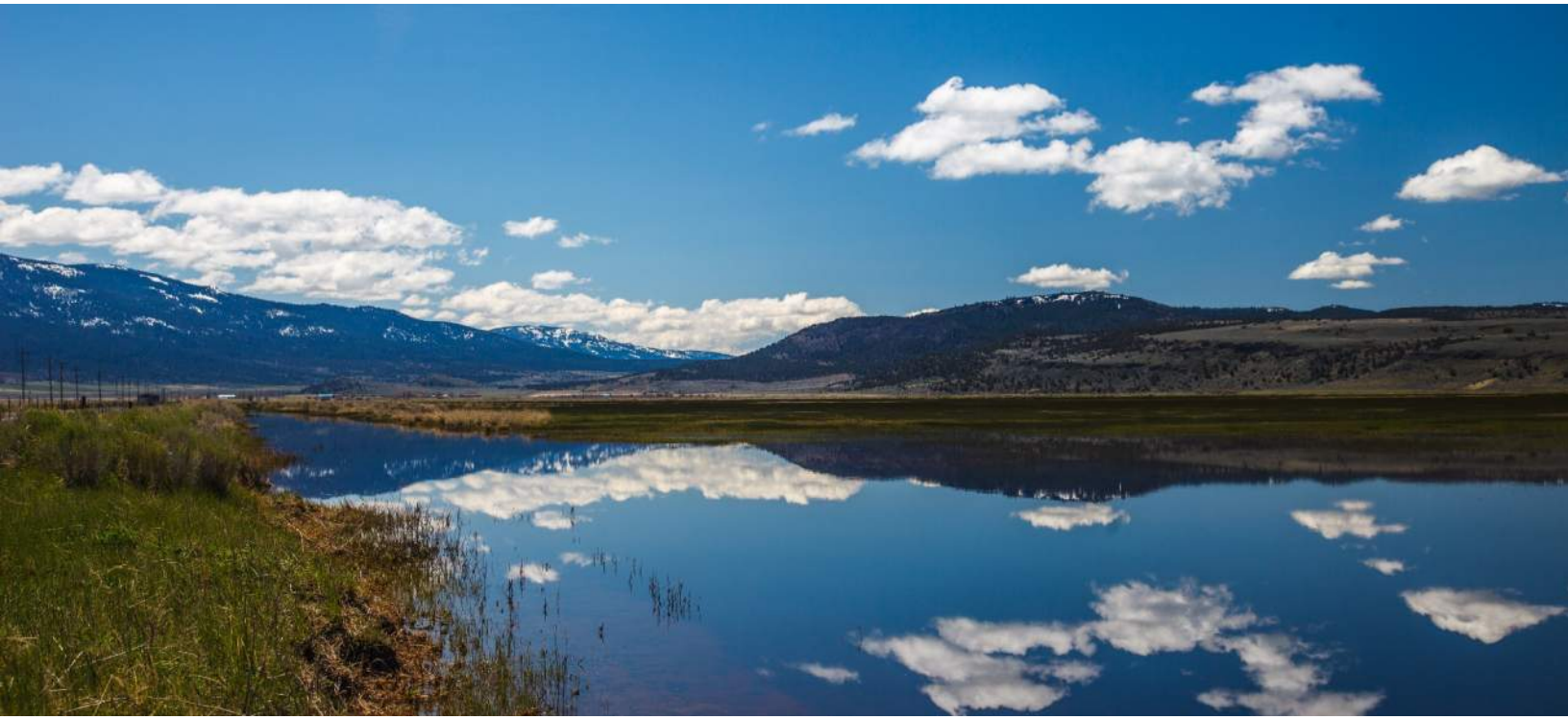
Project ID	Project Name	Project Description	Cost Estimate[1]	Expected County Contribution	Funding Partner
High Priority					
T-2	Expansion of existing services to rural communities	Expand to rural communities, particularly those with underserved populations	$1,000,000	$0	Basin Transit, Quail Trail, ODOT
T-3	Program to create Periodic meetings amongst transit providers	Set up and conduct meetings with all local transit agencies to improve county transit coordination	$50,000	$0	Basin Transit, Quail Trail, Amtrak, SouthWest POINT, ODOT
T-4	Study to Develop/expand transit service in North Klamath County	A study to create a route between La Pine and Klamath County/Klamath Falls	$50,000	$0	Basin Transit, Quail Trail, ODOT, CET
Medium Priority					
T-1	Upgrade transit fleet vehicles	Upgrade with new technologies, bilingual message boards, and bike racks. Includes review of existing bus storage needs.	$250,000	$0	Basin Transit, Quail Trail, ODOT
T-5	Increasing Dial-A-Ride	Increase dial-a-ride service range to unincorporated communities and rural areas.	$4,000,000	$0	Basin Transit, Quail Trail, ODOT
T-6	Development of public transportation education resources	Educate the community about connections available within the County to reach key destinations within and connecting to County communities.	$100,000	$0	Basin Transit, Quail Trail, ODOT
T-7	Update BTS Plan	Update the Basin Transit Service Transit Master Plan.	$100,000	$0	Basin Transit

[1]Cost estimates are preliminary and do not include right-of-way or environmental impacts.

Source: ODOT

RAIL PLAN

Rail service will continue to be an important, energy efficient mode of transportation. The TSP supports the continued use of freight rail tracks and service provided in the County by the Burlington Northern Santa Fe (BNSF) Railway, the Union Pacific Railroad (UP), and the Klamath Northern Railway. Amtrak's *Coast Starlight* provides passenger rail stops in Klamath Falls and Chemult and operates on the Union Pacific rail right of way.



Source: by Murray Foubister - https://www.flickr.com/photos/mfoubister/16059854222/, CC BY-SA 2.0

PIPELINE AND MARINE PLAN

PIPELINE

There are two natural gas pipelines that run through Klamath County. One pipeline runs north-south through the County in close alignment with US97. The pipeline is operated by TransCanada (TC) Energy. The second pipeline runs east-west through Keno and Klamath Falls and terminates in Bonanza. This pipeline is operated by Gas Transmission Northwest LLC. The TSP recommends continued coordination with both service providers within the County.

MARINE

There are no navigable waterways located in Klamath County but there are several waterways and lakes that are used recreationally. As local and regional destinations, access to these bodies of water facilitate tourism, economic development, and environmental conservation efforts. The TSP recommends enhancements to the roadways accessing these recreational areas to improve safety for all users.

Source: US Air Force from USATech. Sgt. Christopher Boitz/U.S. Air Force Air Demonstration. Public Domain.

AIR SERVICE PLAN

Within the County, the largest public use airport is Crater Lake-Klamath Regional Airport (LMT), which provides general aviation activities, services commercial air traffic, and military operations from the Oregon Air National Guard. The LMT airport does not provide passenger service but is a critical component of the freight services throughout the County. The Crater Lake-Klamath Regional Airport is located within the Klamath Falls UGB and therefore, addressed in the Urban Area TSP. *The Crater Lake-Klamath (LMT) Regional Airport Master Plan* was adopted by the City of Klamath Falls in April 2021 and includes additional policies and programs related to the air service system in Klamath County. Klamath County is also home to these smaller-scale public and private airports:

- Publicly owned airports:
  - Beaver Marsh State Airport (Beaver Marsh)
  - Chiloquin State Airport (Chiloquin)
  - Crescent Lake State Airport (Crescent Lake)
  - Malin Airport (Malin)
- Privately owned airports:

- Moondance Ranch Airport (Beatty)
- Allens Airstrip Airport (Bly)
- Wilderness Airport (Bly)
- Long Ranch Airport (Merrill)
- Flying T Ranch Airport (Sprague River)
- Dillon Field (Klamath Falls)
- Sky Wagon Ranch LLC Airport (Klamath Falls)
- Wild Billy Airport (Beatty)

The TSP supports the continued use of these airports for service within the County in the future. Further, the County and City of Klamath Falls will continue to coordinate between freight, rail, and landside services.

5

CHAPTER 5

TRANSPORTATION FUNDING AND IMPLEMENTATION

Source: Wikimedia Commons, by Bobjgalindo - Own work, CC BY-SA 4.0

5. TRANSPORTATION FUNDING AND IMPLEMENTATION

The TSP includes projects under jurisdiction and ownership of several agencies and entities including: ODOT, Klamath County, the Klamath Tribes, the National Park Service, Klamath Falls, Basin Transit Service, Quail Trail Public Transit, Amtrak, SouthWest POINT, Cascades East Transit (CET), Keno Fire Department, and Oregon State Police. The TSP also includes projects that will be implemented by private developers. Individual TSP projects, programs, and studies will be funded through a different combination of federal, state, county, city, and/or private sources. This chapter discusses current and possible new funding mechanisms that may be available to implement projects during the life of the TSP. A complete list of multimodal projects and planning-level cost estimates is in Chapter 4.

Today's fiscal environment is beset by uncertainty about future federal, state, and local funding for transportation projects. This uncertainty provides challenges to accurately forecast the amount of funding available for transportation investments and what projects or programs will receive funding. In this context, the TSP provides a prudent and conservative list of capital construction projects, an emphasis on lower cost methods of improving personal mobility within the County, and an increased reliance on technologies that can improve the efficiencies of County roadways.

Further, the County goals and priorities seek to improve the convenience and safety for people driving, walking, biking, and taking transit as well as for the continued support for the economic health and prosperity of the region.

The highest priority projects for strategic investments are those that (1) protect the existing system and (2) improve the efficiency and safety of existing multimodal facilities. These projects are to be implemented first unless a lower priority measure is demonstrated to be more cost-effective or is one that better supports safety, growth management, or other livability and economic considerations. Further, the list of projects identified in Chapter 4 are intended to make roadways safer for all users as well as more efficient with use of emerging technologies.

The timing of project implementation will depend on future policy direction and funding availability at the federal, state, or local level; changes in local development priorities; or the formation of public-private or public-public partnerships.

In total, the TSP projects are estimated to cost the County up to $161 million over the next 20 years for roadway, ITS, safety, bicycle, pedestrian, and bridge improvements. In addition to these projects, the transit service program recommendations identified within Klamath County are estimated to total approximately $5.55 million. These projects are envisioned to be funded by transit-specific revenues through these providers but may involve partnerships with the County. Table 5-1 summarizes the total estimated County contribution by project type and priority for the TSP solutions. This Plan focuses on the County's anticipated contributions; Volume 2, Appendix E: Technical Memorandum 5: Preferred Solutions includes a summary of ODOT's anticipated contributions.

Table 5-1. County Contribution Costs by Priority

Project Type	High Priority	Medium Priority	Low Priority	Total
Roadway	$ 100,000	$ 25,000	-	$ 125,000
ITS	$ 111,000	$ 28,000	$ 5,000	$ 144,000
Safety	$ 761,000	$ 468,000	$ 109,000	$ 1,338,000
Pedestrian	$ 271,000	$ 652,000	$ 370,000	$ 1,293,000
Bicycle	-	$ 26,570,000	$ 46,660,000	$ 73,230,000
Transit	-	-	-	-
Bridge	$ 15,040,000	$ 930,000	-	$ 15,970,000
Rural Total	**$ 16,283,000**	**$ 28,673,000**	**$ 47,144,000**	**$ 92,100,000**
Estimated Urban TSP Cost[1]	***$9,575,000***	***$23,910,000***	***$35,310,000***	***$68,795,000***
Grand Total	**$25,858,000**	**$52,573,000**	**$81,809,000**	**$160,895,000**

[1] The County's projects, programs, and studies within the Klamath Falls UGB are covered through the Klamath Falls Urban Area TSP. Appendix 1C provides tables with details of the County's projects in the Urban Area. These projects are included in the financial totals to provide a complete understanding of the County's financial outlook.

HISTORICAL REVENUE SOURCES

The Motor Vehicle Apportionment (MVA) and Secure Rural Schools (SRS) funds have been the primary sources in contributing to County transportation improvement projects, particularly operations and maintenance of the existing system. Further, the County's reserve fund – which accrues an annual interest of $700,000 – has been used to procure sizeable capital projects. Additional revenue sources include Reimbursement for Services (RFS), property sales, and other State funding. The sum of available funds varies by year based on fuel consumption and vehicle registrations within the County. Currently, the average annual revenue amounts to approximately $12 million per year.

> The County is operating at an approximately $2.7M per year deficit. This requires the County to use the reserve fund or obtain other funding sources such as grants.

All Public Works "primary" revenue sources (MVA and SRS) in the past two years have been utilized for operation and maintenance of the existing County transportation system. According to expenditures data from the last 10 years, the County typically spends approximately $800,000 on capital projects every year. The County is operating at a deficit of approximately $2.7 million per year. This deficit spending requires the County to use the reserve fund to cover the funding gap or obtain other funding sources such as grants.

Volume 2, Appendix E: Technical Memorandum 5: Preferred Solutions summarizes the revenue, expenditures, and net income for the County's transportation system over the past ten years.

FUNDING PROJECTIONS AND GAPS

Based on historical expenditures and a review of anticipated revenue including HB 2017 increases, the County has estimated a total 20-year revenue of approximately $212.6 million. This estimate equates to between $10 million and $11.5 million in annual revenue, with the estimate decreasing each year as SRS funds decline. Assuming the County's expenditures remain relatively constant, the County will continue to exceed its annual revenue. Therefore, implementation of any of the TSP solutions will require new funding sources or further depletion of the County's reserve fund.

The County has approximately $76 million remaining in the reserve fund as of the year 2020 and has developed several financial scenarios to show what may be accomplished with the reserve fund over the next 20 years. These financial scenarios are tabulated in detail in Appendix 1D and are intended to illustrate potential future financial situations, not obligate the County to implementing TSP projects in a particular order. The project priorities are meant to be flexible, allowing the County to move projects up or down in priority if needs change. The County's funding scenarios include:

- **Scenario 1:** all roadway maintenance and TSP projects are funded, resulting in a $364 million deficit for the County's reserve fund.
- **Scenario 2:** the reserve fund is constrained to its current balance ($75 million); $106 million in roadway maintenance is deferred over the next 20 years; the County's bridge program can only be completed over the next 10 years, with minor bridge repair; the County contributes approximately $75,000 per year to urban safety improvements and ADA ramps; no TSP projects are implemented.
- **Scenario 3:** the reserve fund is constrained to allow implementation of all high priority TSP projects – compared to Scenario 2, this results in deferring only $78 million in roadway maintenance over the next 20 years, more funding for bridge repairs, more funding for urban safety improvements and ADA ramps ($175,000), implementing all high priority TSP projects, and a reserve fund balance of approximately $28.5 million in 2040.

These scenarios illustrate the importance of identifying new funding sources to prevent the County from further depleting its reserve fund. The following section presents potential funding sources that may be considered to address the funding gap for Klamath County.

POTENTIAL FUNDING SOURCES

Potential strategies for addressing the funding gap in Klamath County may generally be grouped into five categories:

1. Evaluate current expenditures;
2. Identify partnership opportunities;
3. Identify additional grant opportunities;
4. Identify public/private sponsorship opportunities; and
5. Raise local revenue through user fees and taxes.

These strategies are discussed below; they are not mutually exclusive.

CURRENT EXPENDITURES

The County may reevaluate its current spending to identify opportunities to reduce existing costs, such as:

- Reducing "Special Projects" (such as distribution of funds to law enforcement, city/county schools);
- Eliminating "Class E" road maintenance;
- Eliminating Forest Highway Maintenance (200 miles of road, 32 bridges); and/or
- Transferring jurisdiction of roads in the suburb to the City of Klamath Falls.

PARTNERSHIP OPPORTUNITIES

In some cases, funds that are primarily intended for one purpose may be leveraged for improving transportation facilities through coordination with other agencies. For example, some of the transit funds provided to Basin Transit Service and Quail Trail can be used to construct bus stops and adjacent sidewalks. The County should identify such partnership opportunities for implementing TSP projects.

ADDITIONAL GRANT OPPORTUNITIES

ODOT and federal programs offer multiple grant opportunities to support transportation projects, as shown in Table 5-2; some require a local match. The County should identify grants that may be applicable to TSP projects and review them annually with the Board of Commissioners to plan for the funding that may be needed for a local match. Using local dollars as a match for a grant opportunity is a strategy to stretch local funding even further.

PUBLIC/PRIVATE SPONSORHIP OPPORTUNITIES

Public/private sponsorships involve a private entity such as a local business owner working with the public agency to fund a project. In return for their investment in the community, these business owners often receive recognition for their role, providing a marketing venue for their business.

LOCAL TAXES AND USER FEES

Many types of user fees and taxes may be collected to finance road construction and operations. The County will need to develop local revenue sources to supplement or replace federal resources if it desires to maintain current levels of service without depleting the reserve fund. Table 5-3 lists options that the County may wish to consider for funding local roads. The sources include a mix of fees and taxes, some of which have implications for other aspects of the County budgets if implemented. Some of these fees could also be used to provide a local match to obtain greater federal or state funding, further stretching local dollars. For example, if an annual fee of $20 per person was applied to the unincorporated County population (approximately 20,500 people), this would result in approximately $2.05 million in revenue over a five-year period. By using this revenue as a 10 percent local match to obtain federal and state grants, the County could leverage these funds to complete $20.5 million of projects within the TSP.

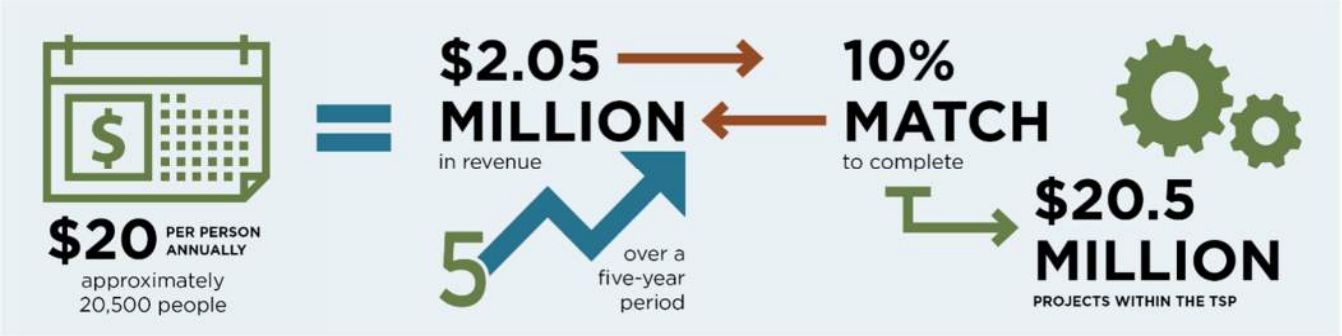


Table 5-2. Potential Grant Opportunities

Funding Source	Intended Use	Applicable Project Types
Federal Sources		
Federal Lands Access Program (FLAP)	Provides funds to improve transportation facilities that provide access to, are adjacent to, or are located within Federal lands	All project types; however, projects must provide access to Federal lands
State Sources		
All Roads Transportation Safety	Uses limited funds to make the highest-impact safety improvements on roads and highways	Safety-related projects
Connect Oregon	Invests in aviation, rail, and marine transportation system across Oregon	Aviation, Rail, and Marine-related projects
Multi-modal Active Transportation Fund	Invests in multimodal transportation infrastructure improvements across Oregon	Pedestrian and bicycle-related projects
Statewide Transportation Improvement Program	Establishes multi-year, statewide, intermodal program of transportation projects to fund	Sidewalks, bikeways, crossing improvements
Safe Routes to School	Focuses on infrastructure and non-infrastructure programs to improve access and safety for children to walk or bike to school	Pedestrian and bicycle-related projects within the vicinity of local schools
Transportation and Growth Management (TGM) Program	Provides funds for projects that help local communities plan for streets and land use to create more livable communities.	Planning projects
ATV Grant Program	Operation and maintenance, law enforcement, emergency medical services, land acquisition, leases, planning, development, and safety education in Oregon's OHV (off-highway vehicle) recreation areas	Shared-use paths
Recreational Trails Program	Recreational trail-related projects, such as hiking, running, bicycling, off-road motorcycling, and all-terrain vehicle riding.	Shared-use paths
Rivers, Trails, and Conservation Assistance Program	Provides technical assistance for recreation and conservation projects.	Shared-use paths
Oregon Parks and Recreation Local Government Grants	Primary use is recreation; transportation is allowed. Construction limited to outside road right-of-way, only in public parks or designated recreation areas.	Shared-use paths
Community Paths Program	Focused on helping communities create and maintain connections through shared-use paths.	Shared-use paths

Table 5-3. Potential Local Revenue Sources

Funding Source	Intended Use	Applicable Project Types
System Development Charges	Uses money from local development projects to fund capital transportation improvements	All project types; however, the projects must be required to accommodate growth associated with new development
Economic Improvement Districts (EIDs)	Pools funds from area businesses to make improvements in the business district.	All project types; however, the projects must be located within the EID area
Local Improvement Districts (LIDs)	Pools funds from property owners to make local transportation improvements	All project types; however, the projects must be located within the LID area
Local Bond Measures	Asks voters for bond funding to finance a set list of infrastructure investments	All project types
Local Fuel Tax	Adds a tax on top of gasoline costs that support roadway operation, maintenance, and preservation	All project types
Fees from Timber Sales	A percentage of timber sales fees in Klamath County are provided to the County, with the remainder allocated to the Oregon Department of Forestry State Forests Division.	All project types
Street Utility Fee/Road Maintenance Fee	Calculates trips generated for land uses and charges owners a fee relative to the number of trips	All project types
Road District	Localizes road construction through finance from members within the local community	All project types
Road Fund Serial Levy	This levy is a voter-approved property tax levied in addition to the permanent tax rate.	Operations or capital programs
Vehicle Registration Fee	An extra fee on all registered motor vehicles in the County.	Operations or capital programs

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APPENDIX 1A

PROJECT SUMMARY TABLES & EVALUATION MATRIX

		Evaulation Criteria										
Project ID	Project	Safety	Environment	Economic Development	Equity	Coordination and Outreach	Transportation and Land Use	Implementation	Total	Priority	Identification Project Type	Other Impacted Project Types
R-1	Passing lane feasibility study on US97 between Algoma Rd intersections	2	-1	2	0	1	2	2	8	high	Roadway	
R-2	Passing lane feasibility study on US97 between Midland and CA border	2	-1	2	0	1	2	2	8	high	Roadway	
R-3	Passing lane feasibility study on OR39 south of K Falls	2	-1	1	0	1	2	2	7	medium	Roadway	
R-4	Passing lane feasibility study on OR140 east of K Falls	2	-1	1	0	1	2	1	6	low	Roadway	
R-5	OR140/OR39 and Reeder Extension IAMP	1	0	1	0	1	2	2	7	medium	Roadway	Safety
R-6	OR140/OR39 Intersection Evaluation									VISION	Roadway	Safety
R-7	OR140 east Extension									VISION	Roadway	
R-8	OR66 Realignment - Keno	2	0	1	0	1	2	1	7	medium	Roadway	
R-9	OR62/Loosley Road Left Turn Lane	2	-1	0	1	1	1	2	6	low	Roadway	Safety
R-10	US97/Kia-Mo-Ya Casino Access IAMP	1	-1	1	1	1	2	1	6	low	Roadway	Safety
R-11	US97/Silver Lake Road Left Turn Lane	2	0	0	1	1	1	2	7	medium	Roadway	Safety
R-12	Northeast Passage Connection - Shady Pine to Foothills									VISION	Roadway	
R-13	Designate Alternate Emergency Route to US97	2	0	0	1	2	1	1	7	medium	Roadway	Safety
R-14	OR66/Clover Creek Road Sight Distance	2	0	0	1	2	2	2	9	high	Roadway	Safety
R-15	New Collector, East of Tingley Lane									DEV	Roadway	
R-16	Delap Pit Access									DEV	Roadway	

		Evaulation Criteria										
Project ID	Project	Safety	Environment	Economic Development	Equity	Coordination and Outreach	Transportation and Land Use	Implementation	Total	Priority	Identification Project Type	Other Impacted Project Types
S-1	OR62 & Chiloquin Rd	2	2	0	2	2	1	2	11	high	Safety	Roadway
S-2	OR140 & Westside Rd	2	2	1	2	2	1	2	12	high	Safety	
S-3	Bliss Road: OR 140 to Sprague River Road (16.5 miles)	2	2	0	2	1	1	1	9	medium	Safety	Roadway, Bicycle
S-4	Sprague River Road: OR 140 to US 97 (35 miles)	2	2	1	1	2	1	1	10	medium	Safety	Roadway, Bicycle
S-5	US97/OR138	2	2	0	2	2	1	2	11	low	Safety	Roadway
S-6	OR62 & OR422	2	2	0	2	2	1	2	11	high	Safety	Roadway
S-7	Mississippi Drive & Highway 97 N	2	2	0	2	2	1	2	11	high	Safety	Roadway
S-8	Highway 39 & OR140	2	2	0	1	2	1	2	10	medium	Safety	Roadway
S-9	East Odell Road & Highway 58	2	1	0	1	1	1	2	8	low	Safety	
S-10	Vale Road & Highway 140 E	2	2	0	2	2	1	2	11	high	Safety	
S-11	Lower Klamath Road between Cross Rd and Township Rd									VISION	Safety	
S-12	Spring Lake Road between Old Midland Rd and Cross Rd	2	2	0	1	1	1	1	8	low	Safety	
S-13	Crescent Cutoff Road & OR58	2	2	0	2	2	1	2	11	high	Safety	
S-14	Sun Mountain Road & Highway 62	2	2	0	2	1	1	2	10	medium	Safety	
S-15	US97/Algoma Rd	2	1	0	2	2	1	2	10	medium	Safety	Roadway
S-16	US97/Shady Pine Road	2	1	0	2	2	1	2	10	medium	Safety	Roadway
S-17	US97/Keno Worden Rd	2	1	1	2	2	1	2	11	high	Safety	Roadway
S-18	Seven Mile Road between Westside Road and Weed Road	2	1	0	1	2	1	1	8	low	Safety	
S-19	Silver Lake Road - Chevrons and Delineators (US97 to County Limits)	2	2	0	1	1	1	2	9	medium	Safety	
S-20	Lakeshore Drive - Chevrons and Delineators (OR140 to Klamath Falls UGB)	2	2	1	1	1	1	2	10	medium	Safety	
S-21	Hill Road - Chevrons and Delineators (Crystal Springs Rd to Merrill City Limits)	2	2	0	1	1	1	2	9	medium	Safety	
S-22	S Poe Valley Rd - Chevrons (Harpold Rd to Crystal Springs Rd)	2	2	0	1	1	1	2	9	medium	Safety	
S-23	Systemic Sign Upgrades at: OR39 Klamath falls Malin Hwy: Chin Rd, Merrill Pit Rd, Malone Rd, OR62/Chiloquin Rd, US97/Sawmill Rd	2	2	0	2	2	1	2	11	high	Safety	
S-24	Drew Road Safet Improvements: Chevrons and delineators	2	0	0	2	2	1	2	9	medium	Safety	
S-25	Center Rumble Strips on Old Fort Road	2	2	0	1	1	1	1	8	low	Safety	
S-26	OR 140/Lake of the Woods MP 46.25 to 48.25 clear zone	2	1	1	2	2	1	2	11	high	Safety	Roadway
S-27	Delap Pit Road Realignment	2	1	1	2	2	1	2	11	high	Safety	Roadway
S-28	North Poe Valley Road Safety Improvement	2	1	1	2	2	1	1	10	medium	Safety	Roadway
S-29	S Chiloquin Road guardrail installation	2	1	1	2	2	1	2	11	high	Safety	
S-30	US97/Wocus intersection improvement	2	1	0	2	2	1	2	10	medium	Safety	Roadway
S-31	Henley School Area Safety Improvements	2	0	1	2	2	2	2	11	high	Safety	
S-32	Install chevrons and delieators on Bly Mountain Cut-off Road	2	1	0	2	2	1	2	10	medium	Safety	
S-33	Install chevrons and delieators on Modac Point Road	2	1	0	2	2	1	2	10	medium	Safety	

		Evaluation Criteria										
Project ID	Project	Safety	Environment	Economic Development	Equity	Coordination and Outreach	Transportation and Land Use	Implementation	Total	Priority	Identification Project Type	Other Impacted Project Types
I-1	Install communications and maintain up to date communications map.	1	1	1	1	1	1	2	8	high	ITS	
I-2	Install new PTZ cameras at select intersections and connect to TripCheck	1	1	1	1	1	1	2	8	high	ITS	
I-3	Install Variable Message Signs (VMS) at key junctions	1	1	1	1	1	1	2	8	high	ITS	
I-4	Install cameras with live feed capabilities at key locations	1	1	1	1	1	1	2	8	high	ITS	
I-5	Connect Crater Lake National Park camera to TripCheck and display snow zone and gas information	1	1	1	1	1	1	2	8	high	ITS	
I-6	Implement weather responsive variable speed limits on US 97	1	1	1	1	1	1	2	8	medium	ITS	Safety
I-7	Create a Central data storage/sharing system	1	1	1	1	1	1	2	8	medium	ITS	
I-8	Install wildlife detection system on US97 near MP174,190 and 190	1	1	1	1	1	1	2	8	low	ITS	Safety
I-9	Install dynamic curve speed warning signs on OR66 approaching curves	1	1	1	1	1	1	2	8	low	ITS	Safety
I-10	Install Road Weather Information Systems (RWIS) with ice detection at key locations.	1	1	1	1	1	1	2	8	high	ITS	Safety
I-11	Install activated ice warning signs at key locations.	1	1	1	1	1	1	2	8	high	ITS	Safety
I-12	Install automatic changeable snow zone and chain restriction signs	1	1	1	1	1	1	2	8	high	ITS	Safety
I-13	Install sensors that automatically notify agencies and travelers when rock fall occur on US97 near Upper Klamath Lake and rick slide signs on OR140	1	1	1	1	1	1	2	8	medium	ITS	Safety
I-14	Variable Speed Limit Study - OR 140 Lake of the Woods	1	1	1	1	1	1	2	8	low	ITS	Safety
I-15	Install Automated Vehicle Location (AVL) and logging capabilities (sanding, de-icing, and spraying) in maintenance and construction vehicles	1	1	1	1	1	1	2	8	high	ITS	
I-16	Implement telematics technology on fleet vehicles	1	1	1	1	1	1	2	8	high	ITS	
I-17	Install Automated Asset Management Tool for the following infrastructure: street lights, cameras, VMS, RWIS	1	1	1	1	1	1	2	8	medium	ITS	
I-18	Purchase software that optimizes snow plow routes and resources	1	1	1	1	1	1	2	8	medium	ITS	Safety
I-19	Create 9-1-1 Dispatch Interconnect	1	1	1	1	1	1	2	8	high	ITS	Safety
I-20	Develop Traffic Incident Management (TIM) Team	1	1	1	1	1	1	2	8	high	ITS	Safety
I-21	Integrate the Intterra Situational Awareness software during incident or emergency response	1	1	1	1	1	1	2	8	high	ITS	Safety
I-22	Purcahse Portable Variable Message Signs (VMS) for events and incidents	1	1	1	1	1	1	2	8	high	ITS	Roadway, Safety
I-23	Invest in technology that allows first responders to send and receive photos and video from an incident scene	1	1	1	1	1	1	2	8	medium	ITS	Safety
I-24	Install devices with Automated infrastructure integrity notification capabilities	1	1	1	1	1	1	2	8	low	ITS	
I-25	Real-time transit information and notifications	1	1	1	1	1	1	2	8	high	ITS	Transit
I-26	Automated transit vehicle on-board data tracking and logging	1	1	1	1	1	1	2	8	high	ITS	Transit
I-27	Provide automated push messages to truck drivers to alert drivers of restrictions (height, weight, length, and width) along route choices.	1	1	1	1	1	1	2	8	high	ITS	Roadway
I-28	Invest in Real-time freight parking information	1	1	1	1	1	1	2	8	high	ITS	Roadway
I-29	Update Klamath County ITS Plan	1	1	1	1	1	1	2	8	medium		

		Evaulation Criteria										
Project ID	Project	Safety	Environment	Economic Development	Equity	Coordination and Outreach	Transportation and Land Use	Implementation	Total	Priority	Identification Project Type	Other Impacted Project Types
P-1	Enhance crossing on OR140 at OC&E Woods Line Trail in Bly	2	2	1	2	2	2	2	13	high	Pedestrian	Safety
P-2	Chiloquin Blvd - construct a shared-use path on the southeast side of the road	2	1	0	2		2	2	9	medium	Pedestrian	Safety, Bicycle
P-3	OR422 mid block crossing - west of Chiloquin City Limits	2	2	1	2	2	2	2	13	high	Pedestrian	Safety
P-4	[Bly] Shared-use path paving resurfacing on OR140 between the Fire Department (west) and Edsall St	2	1	1	2	2	2	2	12	high	Pedestrian	Safety, Bicycle
P-5	[Bly] Construct a shared use path from OR140 to the Community school via CR501 and Metler St	2	2	1	2	2	1	1	11	medium	Pedestrian	Safety, Bicycle
P-6	Enhanced crossing on US97 in Crescent	2	2	1	2	2	1	1	11	medium	Pedestrian	Safety
P-7	[Beatty] extend sidewalk on southside of OR140 from Hutchinson Rd to Yellow Springs Road	2	1	2	2	2	1	2	12	high	Pedestrian	Safety
P-8	[Sprauge River] construct sidewalk on both sides of Sprauge River Rd between Main St (S) and Main St (N)	2	1	2	2	2	1	1	11	medium	Pedestrian	Safety
P-9	[Keno] construct sidewalk on both sides of OR66 between Needle Dam Rd and River St	2	1	2	2	2	1	2	12	high	Pedestrian	Safety
P-10	[Keno] construct sidewalk on both sides of Keno Worden Rd between OR66 and Folley Ln	2	1	1	2	2	1	1	10	low	Pedestrian	Safety
P-11	[Chemult] construct sidewalk on US97 between Chalet restaurant (south) and the Fire Department (north)	2	1	2	2	2	1	2	12	high	Pedestrian	Safety
P-12	enhance crossing on OR140 at OC&E Woods Line Trail in Dairy	2	2	1	2	2	2	2	13	high	Pedestrian	Safety
P-13	ADA ramp installation program	2	1	2	2	2	2	2	13	high	Pedestrian	Safety
P-14	Enhanced crossing on US97 in Chemult	2	2	1	2	2	1	1	11	medium	Pedestrian	Safety

		Evaulation Criteria										
Project ID	Project	Safety	Environment	Economic Development	Equity	Coordination and Outreach	Transportation and Land Use	Implementation	Total	Priority	Identification Project Type	Other Impacted Project Types
B-1	widen shoulders on Clover Creek Rd between Dead Indian Road and OR66	2	0	0	2	2	1	2	9	low	Bicycle	Safety, Pedestrian
B-2	widen shoulders on OR140 between Greylock Way and Forest Road 3610									VISION	Bicycle	Safety, Pedestrian
B-3	widen shoulders on OR140 between Westside Road and Lakeshore Drive where shoulder width is less than 6 feet									VISION	Bicycle	Safety, Pedestrian
B-4	widen shoulders on OR66 and Keno Worden Road between Bill Scholter Sportsman Park and US97 where paved shoulder width is less than 6 feet									VISION	Bicycle	Safety, Pedestrian
B-5	widen shoulders on OR140 between Klamath County UGB and Smith Road (Bly) where paved shoulder width is less than 6 feet									VISION	Bicycle	Safety, Pedestrian
B-6	widen shoulders on Bliss Road between Sprague River Road and OR140 where paved shoulder width is less than 6 feet	2	0	0	2	2	1	1	8	low	Bicycle	Safety, Pedestrian
B-7	widen shoulders on Sprague River Road between Bliss Road and US97 where paved shoulder width is less than 6 feet	2	0	0	2	2	2	1	9	medium	Bicycle	Safety, Pedestrian
B-8	widen shoulders on OR62 between US97 and Fort Klamath where paved shoulder width is less than 6 feet									VISION	Bicycle	Safety, Pedestrian
B-9	widen shoulders on OR39 between Klamath Falls UGB and Roberta Dr where paved shoulder width is less than 6 feet	2	0	0	2	2	2	1	9	medium	Bicycle	Safety, Pedestrian
B-10	widen shoulders on OR66 between Kern Swamp Road and Keno where paved shoulder width is less than 6 feet									VISION	Bicycle	Safety, Pedestrian
B-11	widen shoulders on Dead Indian Road between Clover Creek Rd and OR140	2	0	0	2	2	1	1	8	low	Bicycle	Safety, Pedestrian
B-12	widen shoulders on OR138 (Adventure Cycling Route) from US97 to County limit where paved shoulder width is less than 6 feet									VISION	Bicycle	Safety, Pedestrian
T-1	Upgrade transit fleet vehicles with new technologies, bilingual message boards, and bike racks	1	0	1	2	2	2	2	10	medium	Transit	
T-2	Expansion of existing services to rural communities	2	2	2	2	2	2	2	14	high	Transit	
T-3	Program to create Periodic meetings amongst transit providers	0	1	0	2	2	2	2	9	high	Transit	
T-4	Study to Develop/expand transit service in North Klamath County (Route from La Pine to Klamath County)	2	1	2	2	2	2	2	13	high	Transit	
T-5	Increasing Dial-A-Ride	2	0	2	2	2	2	2	12	medium	Transit	
T-6	Development of public transportation education resources	2	0	1	2	2	2	2	11	medium	Transit	
T-7	Updated BTS Plan	2	0	1	2	2	2	2	11	medium		

		Evaulation Criteria										
Project ID	Project	Safety	Environment	Economic Development	Equity	Coordination and Outreach	Transportation and Land Use	Implementation	Total	Priority	Identification Project Type	Other Impacted Project Types
D-1	Bridge Rehabilitiation at Matney Way (Lost River)	2	1	0	0	0	2	1	6	high	Bridge	
D-2	Bridge Replacement at W Langell Valley Rd (Irrigation canal)	2	1	0	0	0	2	1	6	high	Bridge	
D-3	Bridge Rehabilitiation at Ivory Pine Rd (Meryl Creek)	2	1	0	0	0	2	1	6	high	Bridge	
D-4	**Bridge Rehabilitiation at Dodds Hollow (Irrigation canal)**	2	1	0	0	0	2	1	6	medium	Bridge	
D-5	Bridge Rehabilitiation at I O O F Cemetery Rd (Irrigation canal)	2	1	0	0	0	2	1	6	high	Bridge	
D-6	**Bridge Rehabilitiation at Washburn Way (Irrigation canal)**	2	1	0	0	0	2	1	6	medium	Bridge	
D-7	Bridge Rehabilitation Study at Reeder Road (Lost River)	2	1	0	0	0	2	1	6	high	Bridge	
D-8	Bridge Rehabilitation at Crescent Cutoff Road (Little Deschutes River)	2	1	0	0	0	2	1	6	high	Bridge	
D-9	Bridge Rehabilitation at Gift Road (Lost River)	2	1	0	0	0	2	1	6	high	Bridge	
D-10	Bridge Replacement at Cambell Road (Ditch)	2	1	0	0	0	2	1	6	high	Bridge	
D-11	Bridge Replacement at Swan Lake Road (Drainage Ditch)	2	1	0	0	0	2	1	6	high	Bridge	
D-12	Brige Replacement at Ivory Pine Road (S Sprague River)	2	1	0	0	0	2	1	6	high	Bridge	
D-13	Bridge Replacement at Sprague River Road (Whiskey Creek)	2	1	0	0	0	2	1	6	high	Bridge	
D-14	Bridge Replacement at Langell Valley Road (Lost River)	2	1	0	0	0	2	1	6	high	Bridge	
D-15	Bridge Rehabilitiation at Spring Lake Road (Drain Ditch)	2	1	0	0	0	2	1	6	high	Bridge	
D-16	Bridge Replacement at Homedale Road (Irrigation Canal)	2	1	0	0	0	2	1	6	high	Bridge	
D-17	Bridge Rehabilitation at McQuiston Road (Seven Mile Canal)	2	1	0	0	0	2	1	6	high	Bridge	
D-18	Bridge Replacement Matney Road (Irrigation Canal)	2	1	0	0	0	2	1	6	high	Bridge	
D-19	Bridge Replacement at Weed Road (Wood River)	2	1	0	0	0	2	1	6	high	Bridge	
D-20	Bridge Rehabilitation at Gerber Road (Irrigation Canal)	2	1	0	0	0	2	1	6	high	Bridge	
D-21	Bridge Replacement at Gerber Road (Ben Hall Creek)	2	1	0	0	0	2	1	6	high	Bridge	
D-22	Bridge Rplacement at Langell Valley Road (Lost River)	2	1	0	0	0	2	1	6	high	Bridge	
D-23	Bridge Replacement at Short Road (Canal)	2	1	0	0	0	2	1	6	high	Bridge	
D-24	Bridge Rehabilitation at Anderson Road (Irrigation Canal)	2	1	0	0	0	2	1	6	high	Bridge	
D-25	Bridge Replacement at Poe Valley Road (Harpold Dam-Lost River)	2	1	0	0	0	2	1	6	high	Bridge	
D-26	Bridge Rehabilitation at Holl Road (Low Line Canal)	2	1	0	0	0	2	1	6	high	Bridge	
D-27	Bridge Replacement at Stateline Road (J-11 Lateral)	2	1	0	0	0	2	1	6	high	Bridge	
D-28	Bridge Replacement at Saddle Mount Pit Road (Sprague River)	2	1	0	0	0	2	1	6	high	Bridge	
D-29	Bridge Replacement at Poe Valley Road (F Canal)	2	1	0	0	0	2	1	6	high	Bridge	
D-30	Bridge Replacement at Silver Lake Road (Cattle Pass)	2	1	0	0	0	2	1	6	high	Bridge	
D-31	Bridge Replacement at Hill Road (Irrigation Canal)	2	1	0	0	0	2	1	6	high	Bridge	
D-32	Bridge Replacement at Joe Wright Road (A-3 Irrigation)	2	1	0	0	0	2	1	6	high	Bridge	
D-33	Bridge Replacement at OR58 (Railroad MP 82.4)	2	1	1	0	0	2	2	8	high	Bridge	

APPENDIX 1B

PROJECT COST ESTIMATES

Project ID	Project Name	Description	Segment Length (ft)	Current Width (ft)	Planned Width (ft)	Planning-Level Cost Estimate[1]	Expected County Contribution[2]	Funding Partner[2]	Lead Agency[2]
R-1	US97 North Passing Lane Study	Conduct a passing lane feasibility study for US97 between Algoma Road intersections to determine appropriate location for a passing lane.	N/A	N/A	N/A	$75,000	$0	ODOT	ODOT
R-2	US97 South Passing Lane Study	Conduct a passing lane feasibility study for US97 between Midland and California border to determine appropriate locations for passing lanes.	N/A	N/A	N/A	$75,000	$0	ODOT	ODOT
R-3	OR39 South Passing Lane Study	Conduct a passing lane feasibility study for OR39 south of Klamath Falls to California border to determine appropriate locations for passing lanes.	N/A	N/A	N/A	$75,000	$0	ODOT	ODOT
R-4	OR140 East Passing Lane Study	Conduct a passing lane feasibility study for OR140 east of Klamath Falls to County Line to determine appropriate location(s) for passing lanes.	N/A	N/A	N/A	$75,000	$0	ODOT	ODOT
R-5	OR140/OR39 and Reeder Extension IAMP	Complete an Interchange Area Management Plan for OR140/OR39 including an extension of the Southside Expressway to the Klamath Falls-Lakeview Highway in Olene. Include evaluation of Henley School access.	N/A	N/A	N/A	$250,000	$0	ODOT	ODOT
R-6	OR140/OR39 Intersection Evaluation	Design and construct an intersection improvement as determined by IAMP (R-5).	N/A	N/A	N/A	-	$0	ODOT	ODOT
R-7	OR140 East Extension	Extend OR140 (Southside Expressway) to OR140 (Klamath Falls-Lakeview Hwy) in Olene as determined by IAMP (R-5). Should be coordinated with interchange (R-6).	N/A	N/A	N/A	-	$0	ODOT	ODOT
R-8	OR66 Curve Warning Enhancements (MP 51.2 to 51.5)	To improve safety on the horizontal curve, provide curve warning and visibility treatments such as advance curve warning flashers on existing curve signs (10% curve crash reduction); raised or recessed pavement markers (15% night crash reduction); frequent post-mounted delineators (30% curve crash reduction); guardrail (47% run-off-road crash reduction); chevron signs (16% run-off-road crash reduction); oversized, doubled up, and/or fluorescent yellow sheeting for advance curve warning signs (20% run-off-road crash reduction; and/or shoulder rumble strips (22% run-off-road crash reduction). Crash reduction estimates based on ODOT's approved CRF list.	N/A	N/A	N/A	$30,000	$0	ODOT	ODOT
R-9	OR62/Loosley Road Left Turn Lane	Construct a dedicated northbound left-turn lane and widen shoulders at intersection to support as an alternate freight route to US97.	N/A	N/A	N/A	$590,000	$0	ODOT	ODOT
R-10	US97/Kia-Mo-Ya Casino Access IAMP	Prepare an Interchange Area Management Plan (IAMP) to determine the appropriate intersection form.	N/A	N/A	N/A	$250,000	$0	ODOT, Klamath Tribe	ODOT
R-11	US97/Silver Lake Road Left Turn Lane	Construct a dedicated northbound left-turn lane and widen shoulders at intersection to improve safety.	N/A	N/A	N/A	$1,000,000	$0	ODOT	ODOT
R-12	Northeast Passage Connection - Shady Pine to Foothills	Extend Foothills Blvd to Shady Pine Road. Includes access to OIT and Sky Lakes.	N/A	N/A	N/A			N/A	County
R-13	Alternate Emergency Route to US97	Designate an alternate route for vehicles and freight on OR422, OR62, Westside Road, OR140, OR66, and Keno Worden Road in case of emergency closure or shut down of US97. Provide alternate route signage and designation. In cases of tight curves, curve treatments (signs, flashers, delineators, chevrons, guardrail, etc.) and "narrow road" warning signs may be needed.	N/A	N/A	N/A	$50,000	$25,000	ODOT	ODOT
R-14	OR66/Clover Creek Road	Improve intersection sight distance and by realigning the intersection to reduce open pavement with a raised or striped median and tightening the turn radius, installing a second stop sign in the raised median, and installing "stop ahead" pavement markings.	N/A	N/A	N/A	$1,000,000	$100,000	ODOT	ODOT
R-15	New Collector, East of Tingley Lane	Construct new connector, approximately 0.5 mile in length, extending east of Tingley Lane	N/A	N/A	N/A		0	Development	County

Project ID	Project Name	Description	Segment Length (ft)	Current Width (ft)	Planned Width (ft)	Planning-Level Cost Estimate[1]	Expected County Contribution[2]	Funding Partner[2]	Lead Agency[2]
R-16	Delap Pit Access	Construct a minor collector to provide access to the property. Alignment to be determined by future development and ODOT Access Spacing Standards	N/A	N/A	N/A	$0	$0	Development	County
I-1	Install communications and maintain up to date communications map.	Install roadside communication connections (as described in the communications plan in the Klamath County ITS Plan)	N/A	N/A	N/A	$50,000	$0	ODOT	ODOT
I-2	Install new PTZ cameras at select intersections and connect to TripCheck	Install at US97 Mile Post 271.2 (Truck Weigh Station)	N/A	N/A	N/A	$10,000	$0	ODOT	ODOT
I-3	Install Variable Message Signs (VMS)	Install at a) SB US97 north of Crescent Cutoff Road b) NB US97 south of OR58 c)SB US97 MP 204 d)SB US97 north of OR138 e) NB and SB US97 at MP 223 f) NB US97 at Silver Lake Road g) NB US97 at MP 244 h) NB US97 at Sprague River Road i) SB US97 north of Klamath Falls UGB j) EB OR140 west of Westside Road k) NB OR62 near Crater Lake exit l) WB OR138 near Crater Lake exit	N/A	N/A	N/A	$6,000,000 (approx. $500,000 each)	$0	ODOT	ODOT
I-4	Install cameras with live feed capabilities	Install at: a) Silver Lake Road MP 27 b) Dead Indian Road MP 30.6 c) Willianson River Road MP 17 d) OR140 near MP 20-24 e) OR39 near Merrill f) OR66 MP 43 g) OR62 MP 84	N/A	N/A	N/A	$280,000 (approx. $40,000 each)	$28,000 (approx. $4,000 each)	ODOT	ODOT
I-5	Connect Crater Lake National Park camera to TripCheck and display snow zone and gas information	Connect camera on Munson Valley road at Park entrance to ODOT TripCheck System to display snow zone information and gas availability at the park.	N/A	N/A	N/A	$10,000	$1,000	ODOT, NPS	NPS
I-6	Implement weather responsive variable speed limits on US 97	Install between MP 204-244 and MP 143-164. (Note: ODOT plans for approximately 75% of MP 144-164 to be complete in 2021.)	N/A	N/A	N/A	$8,740,000	$0	ODOT	ODOT
I-7	Create a Central data storage/sharing system	Create a central data storage system that can be shared between agencies. Data may include counts, video, speeds, travel time, etc.	N/A	N/A	N/A	$110,000	$11,000	ODOT	ODOT
I-8	Install wildlife detection system	Install at: a) US97 MP 174 b) US97 MP 190 c) US97 MP 206	N/A	N/A	N/A	$2,730,000 (approx. $910,000 each)	$0	ODOT	ODOT
I-9	Install dynamic curve speed warning signs on OR66	Dynamic feedback signs can measure the speed of individual vehicles and post messages.	N/A	N/A	N/A	$140,000	$0	ODOT	ODOT
I-10[3]	Install Road Weather Information Systems (RWIS) with ice detection	Install at: a) OR140 MP 20-24 b) OR39 near Merrill c) OR66 MP 43 d) OR62 MP 84 e) weather station at Crater Lake	N/A	N/A	N/A	$220,000 (approx. $44,000 each)	$0	ODOT	ODOT

Project ID	Project Name	Description	Segment Length (ft)	Current Width (ft)	Planned Width (ft)	Planning-Level Cost Estimate[1]	Expected County Contribution[2]	Funding Partner[2]	Lead Agency[2]
I-11[3]	Install activated ice warning signs	Install at: a) OR140 MP 19-40 b) OR140 MP 51-59 c) US97 MP 178-204 d) US97 MP 229-235 e) US97 MP 241-246 f) US97 MP 258-267 g) US97 MP 283-288 h) OR66 MP 32-45 i) OR58 MP 70-83	N/A	N/A	N/A	$440,000 (approx. $49,000 each)	$0	ODOT	
I-12	Install automatic changeable snow zone and chain restriction signs	Install at: a) NB US97 near MP 240-243 b) WB OR140 MP 41 c) EB OR140 near MP 25-35 d) OR140 near MP 53-57 e) WB OR58 near Odell Butte	N/A	N/A	N/A	$550,000 (approx. $110,000 each)	$0	ODOT	ODOT
I-13	Install sensors that automatically notify agencies and travelers when rock fall occur	Install at US97 near Upper Klamath Lake and add rockslide signs on OR140	N/A	N/A	N/A	$100,000	$0	ODOT	ODOT
I-14	Variable Speed Limit Study at OR 140 near Lake of the Woods	Conduct a variable speed limit study along OR 140, the Lake of the Woods area.	N/A	N/A	N/A	$100,000	$0	ODOT	ODOT
I-15	Install Automated Vehicle Location (AVL) and logging capabilities (sanding, de-icing, and spraying) in maintenance and construction vehicles	Install AVL and activity logging capabilities in maintenance and construction vehicles and create an automated process for trucks to log sanding, deicing, and pesticide spray information.	N/A	N/A	N/A	$80,000	$8,000	ODOT, Klamath Falls	ODOT
I-16	Implement telematics technology on fleet vehicles	Telematics capabilities that can be used to track vehicle performance and vehicle maintenance.	N/A	N/A	N/A	$80,000	$8,000	ODOT, Klamath Falls	ODOT
I-17	Install Automated Asset Management Tool	Install for the following infrastructure: streetlights, cameras, VMS, and RWIS	N/A	N/A	N/A	$50,000	$5,000	ODOT, Klamath Falls	ODOT
I-18	Purchase software that optimizes snowplow routes and resources	During storm events or adverse weather conditions, software can help to optimize plow routes and distribution of limited resources.	N/A	N/A	N/A	$110,000	$11,000	ODOT, Klamath Falls	ODOT
I-19	Create 9-1-1 Dispatch Interconnect	Connect the 9-1-1 dispatch center with ODOT and OSP through a software update (no construction required). Note that the current BUS to connect such systems is set to be retired but may be joined with Portland system.	N/A	N/A	N/A	$0	$0	Klamath 9-1-1, OSP, ODOT	Klamath 9-1-1
I-20	Develop Traffic Incident Management (TIM) Team	Develop a TIM team for the Klamath County area that includes responders from ODOT, Fire, Tow (OTTA), Law Enforcement, County, Cities, and 911 dispatch. Establish regular meetings and communication with the TIM Team.	N/A	N/A	N/A	$660,000	$66,000	ODOT	ODOT
I-21	Integrate the Intterra Situational Awareness software during incident or emergency response	The software can track where each of the response agencies/vehicles is (en route, at the scene, and during clean up) and improve communication between responders.	N/A	N/A	N/A	$1,220,000	$0	Keno Fire Department, ODOT, OSP	ODOT
I-22	Purchase Portable Variable Message Signs (VMS).	Purchase additional portable VMS to use during events and incidents.	N/A	N/A	N/A	$50,000 (each)	$0	ODOT	
I-23	Sharing On-Scene Photos and Video	Invest in technology that allows first responders to send and receive photos and video from an incident scene. This can currently be done, but systems should be maintained to stay current with the latest technology.	N/A	N/A	N/A	$10,000	$1,000	ODOT, OSP	ODOT

Project ID	Project Name	Description	Segment Length (ft)	Current Width (ft)	Planned Width (ft)	Planning-Level Cost Estimate[1]	Expected County Contribution[2]	Funding Partner[2]	Lead Agency[2]
I-24	Install devices with Automated infrastructure integrity notification capabilities	Install devices that automatically notify responsible agency if infrastructure is damaged. As new infrastructure is built, this strategy should be evaluated on a case by case basis.	N/A	N/A	N/A	$50,000	$5,000	ODOT	ODOT
I-25	Real-time transit information and notifications	Provide transit users with real-time information about next arrivals, significant delays, route changes, or other trip related information.	N/A	N/A	N/A	$90,000	$0	Basin Transit	Basin Transit
I-26	Automated transit vehicle on-board data tracking and logging	Install on-board devices to automatically track and log boarding's, de-boardings, use of lift, etc.	N/A	N/A	N/A	$40,000	$0	Basin Transit	Basin Transit
I-27	Provide automated push messages to truck drivers to alert drivers of restrictions (height, weight, length, and width) along route choices.	Such areas include: a) railroad structures on OR39 b) restricted width area on US97 near N Klamath interchange and between Algoma Road and Shady Pine Road.	N/A	N/A	N/A	$110,000	$0	ODOT Motor Carrier	ODOT
I-28	Invest in Real-time freight parking information	Consider the following areas: a) Chiloquin Casino b) rest area at Midland c) Pilot Travel center in Chemult	N/A	N/A	N/A	$110,000	$0	ODOT, private partnership	ODOT
I-29	Update Klamath County ITS Plan	Update the current ITS Plan to reflect new technologies and completed projects.	N/A	N/A	N/A	$100,000	$0	ODOT	ODOT
S-1	OR62& Chiloquin Road Intersection Safety Improvement	Near-Term: Install systemic signage and striping enhancements to increase intersection visibility, including stop ahead signs, larger signs, additional stop signs, flashing warning signs, side-street center islands, and/or other intersection warning or regulatory signs. ODOT has planned implementation of these with ARTS funding. Medium-Term: Review sight distance to the north to confirm whether sag curve exists. Long-Term: Complete intersection control improvement to reduce angle and turning movement crashes and to slow speeds.	N/A	N/A	N/A	Funded $1,000 $3,000,000	$0 $300,000	ODOT	ODOT
S-2	OR140 & Westside Rd Intersection Safety Improvement	Install systemic signage and striping enhancements to increase intersection visibility, including stop ahead signs, larger signs, additional stop signs, flashing warning signs, side-street center islands, and/or other intersection warning or regulatory signs.	N/A	N/A	N/A	$40,000 to $80,000	$0	ODOT	ODOT
S-3	Bliss Road Corridor Safety Improvement: OR140 to Sprague River Road	Widen roadway shoulders to at least 6 feet [cost for shoulders included in B-6]; Install shoulder rumble strips; Install speed feedback signs throughout key locations within corridor; Increase speed enforcement and outreach/education throughout corridor. Evaluate opportunities to improve visibility at intersections, driveways, and curves by increasing reflectivity. Install chevrons and delineators at curves.	N/A	N/A	N/A	$16,730,00 (shoulder widening from solution B-6) $80,000 (all other S-3 treatments)	$80,000	N/A	County

Project ID	Project Name	Description	Segment Length (ft)	Current Width (ft)	Planned Width (ft)	Planning-Level Cost Estimate[1]	Expected County Contribution[2]	Funding Partner[2]	Lead Agency[2]
S-4	Sprague River Road Corridor Safety Improvement: OR140 to US97	Widen roadway shoulders to at least 6 feet [cost for shoulders included in B-7]; Install shoulder rumble strips; Install speed feedback signs throughout key locations within corridor, including one at MP 13; Increase speed enforcement and outreach/education throughout corridor. Evaluate opportunities to improve visibility at intersections, driveways, and curves by increasing reflectivity. Install chevrons and delineators at curves.				$26,570,000 (shoulder widening from solution B-7) $183,000 (all other S-4 treatments)	$183,000	N/A	County
S-5	US97/OR138 Intersection Safety Improvement	Define access point(s) along eastern edge of intersection. Property is currently open which may be associated with unclear driver expectations	N/A	N/A	N/A	$100,000	$0	ODOT	ODOT
S-6	OR62/OR422 Intersection Safety Improvement	Near-Term: Install systemic signage and striping enhancements to increase intersection visibility, including stop ahead signs, larger signs, additional stop signs, flashing warning signs, side-street center islands, and/or other intersection warning or regulatory signs. Evaluate intersection sight distance to determine if Crater Lake sign should be relocated to improve sight distance for westbound vehicles looking north. Medium-Term/Long-Term: Install left-turn lanes on all approaches OR Install roundabout. Note: roundabouts are more costly than constructing turn lanes.	N/A	N/A	N/A	Near-Term: $40,000 to $80,000 Long-Term (Roundabout): $4,000,000	$0	ODOT	ODOT
S-7	Mississippi Drive/US97 Intersection Safety Improvement	Install southbound left-turn lane; Consider gateway feature and/or cross-section changes, as well as extending the existing multi-use path along US 97 to Mississippi Drive to "urbanize" the corridor in the Gilchrist area. Features may include curb, raised median, landscaping, illumination, etc.	N/A	N/A	N/A	$300,000 for turn lane	$0	ODOT	ODOT
S-8	Old Midland Road	Install chevrons and delineators at curves between US 97 and OR 39.	N/A	N/A	N/A	$6,000	$6,000	-	County
S-9	East Odell Road/OR58 Intersection Safety Improvement	Evaluate curve for appropriate curve signage and delineation including chevrons, post delineators, and curve warning signs. Increase intersection awareness with signing and pavement markers.	N/A	N/A	N/A	$10,000	$0	ODOT	ODOT
S-10	Vale Road & OR140 Intersection Safety Improvement	Increase sight distance for northbound vehicles to the west by removing tree. Increase intersection awareness with larger stop signs and pavement markings.	N/A	N/A	N/A	$30,000	$0	ODOT	ODOT

Project ID	Project Name	Description	Segment Length (ft)	Current Width (ft)	Planned Width (ft)	Planning-Level Cost Estimate[1]	Expected County Contribution[2]	Funding Partner[2]	Lead Agency[2]
S-11	Lower Klamath Road between Cross Rd and Township Rd	Widen roadway shoulders to at least 6 feet; Install shoulder rumble strips; Install speed feedback signs; Increase speed enforcement and outreach/education throughout corridor.	N/A	N/A	N/A			N/A	County
S-12	Spring Lake Road Corridor Safety Improvement: Old Midland Road to Cross Road	Install speed feedback signs and increase speed enforcement	N/A	N/A	N/A	$50,000	$50,000	N/A	County
S-13	Crescent Cutoff Road/OR58 Intersection Safety Improvement	Near-Term: Install systemic signage and striping enhancements to increase intersection visibility, including stop ahead signs, larger signs, additional stop signs, flashing warning signs, side-street center islands, and/or other intersection warning or regulatory signs. Medium-Term: Conduct a corridor safety study for Crescent Cutoff Road to determine site-specific safety issues along the roadway.	N/A	N/A	N/A	Near-Term: $40,000 to $80,000 Medium-Term: $50,000	$0	ODOT	ODOT
S-14	Sun Mountain Road/OR62 Intersection Safety Improvement	Install systemic signage and striping enhancements to increase intersection visibility, including stop ahead signs, larger signs, additional stop signs, flashing warning signs, side-street center islands, and/or other intersection warning or regulatory signs.	N/A	N/A	N/A	$40,000 to $80,000	$0	ODOT	ODOT
S-15	US97/Algoma Rd Intersection Safety Improvement	Install flashing intersection ahead warning sign on US97, south of the southern intersection. Consider one that detects vehicles waiting on the side street approach.	N/A	N/A	N/A	$500,000	$0	ODOT	ODOT
S-16	US97/Shady Pine Road Intersection Safety Improvement	Realign northern intersection to reduce skew. Evaluate opportunities to improve sight distance at southern intersection.	N/A	N/A	N/A	$100,000	$0	ODOT	ODOT
S-17	US97/Keno Worden Rd Intersection Safety Improvement	Increase intersection awareness with signing and striping. Add northbound left-turn lane and eastbound right-turn acceleration lane to support freight route.	N/A	N/A	N/A	$340,000	$0	ODOT	ODOT
S-18	Seven Mile Road between Westside Road and Weed Road	Install recommended Chevron signs on horizontal curves; Install centerline rumble strips. Install speed feedback signs and increase speed enforcement1	N/A	N/A	N/A	$50,000	$50,000	N/A	County

Project ID	Project Name	Description	Segment Length (ft)	Current Width (ft)	Planned Width (ft)	Planning-Level Cost Estimate[1]	Expected County Contribution[2]	Funding Partner[2]	Lead Agency[2]
S-19	Silver Lake Road Corridor Safety Improvement	Install chevrons and delineators on curves from US97 to County Limits; Install speed feedback signs and increase speed enforcement	N/A	N/A	N/A	$210,000	$21,000	ODOT	ODOT
S-20	Lakeshore Drive Corridor Safety Improvement	Install chevrons and delineators on curves from OR140 to Klamath Falls UGB; Target winter maintenance at curves on hills where crashes occurred in snow/ice				$110,000	$11,000	N/A	County
S-21	Hill Road Corridor Safety Improvement	Install chevrons and delineators on curves from Crystal Springs Road to Merrill City Limits	N/A	N/A	N/A	$110,000	$11,000	ODOT	ODOT
S-22	S Poe Valley Rd Corridor Safety Improvement	Install chevrons and delineators on curves from Harpold Road to Crystal Springs Road				$110,000	$11,000	ODOT	ODOT
S-23	Intersection Systemic Sign Upgrades	Install systemic signage and striping enhancements to increase intersection visibility, including stop ahead signs, larger signs, additional stop signs, flashing warning signs, side-street center islands, and/or other intersection warning or regulatory signs. Part of an ODOT STIP Project including locations at: a) OR39/ Malin Highway b) OR39/ Chin Road c) OR39/ Merrill Pit Road d) OR39/ Malone Road e) US97/ Sawmill Road	N/A	N/A	N/A	$240,000 to $480,000 (approx. $40,000 to $80,000 each)	$24,000 (approx. $4,000 each) to $48,000 (approx. $8,000 each)	ODOT	ODOT
S-24	Drews Road Safety Improvements	Install chevrons and/or delineators along horizontal curves to address public concern with roadway safety.	N/A	N/A	N/A	$9,000	$9,000	-	County
S-25	Old Fort Road Safety Improvement	Install centerline rumble strips from Loma Linda Drive to the pavement end to reduce risk of crossing crashes.	N/A	N/A	N/A	$9,000	$9,000	-	County
S-26	OR 140 Corridor Safety Improvement	Improve clear zone on OR140 from Mile Post 46.25 to 48.25	N/A	N/A	N/A	$520,000	$0	ODOT	ODOT
S-27	Delap Pit Road Realignment	Phase 3 of the Greensprings IAMP. Realign Delap Pit Road to connect with the realigned OR 140 approximately 1/4 mile from OR66				$3,000,000	$300,000	ODOT	ODOT

Project ID	Project Name	Description	Segment Length (ft)	Current Width (ft)	Planned Width (ft)	Planning-Level Cost Estimate[1]	Expected County Contribution[2]	Funding Partner[2]	Lead Agency[2]
S-28	North Poe Valley Road Safety Improvement	Install chevrons and/or delineators along horizontal curves with curves to address public concern with roadway safety.	N/A	N/A	N/A	$15,000	$15,000	-	County
S-29	S Chiloquin Road Curve Safety Improvement	Install guardrail on two curves just west of US97. Install chevrons and delineators on curves.	N/A	N/A	N/A	$93,000	$93,000	-	County
S-30	US97/Wocus Road Intersection Safety Improvement and Roadway Realignment	Convert both existing intersections to right-in, right-out only; Construct new roadway connection at Cove Point Road	N/A	N/A	N/A	$1,600,000	$0	ODOT	ODOT
S-31	Henley School Area Safety Improvements	Increase school zone awareness with flashing signs, updated pavement legends and pavement markings. Conduct a school circulation study including intersection evaluations at the school access points and OR39/Henley Road and a Safe Routes to School Plan. Fill in sidewalk gaps with ADA sidewalk and curb ramps approaching crossings.	N/A	N/A	N/A	$200,000	$20,000	ODOT, Klamath County School District	ODOT
S-32	Bly Mountain Cut-off Road	Install chevrons and delineators at curves between OR 140 and McCartie Lane.	N/A	N/A	N/A	$14,000	$14,000	-	County
S-33	Modoc Point Road	Install chevrons and delineators at curves between OR 62 and US 97.	N/A	N/A	N/A	$8,000	$8,000	-	County
P-1	Enhanced crossing on OR140 at OC&E Trail – Bly	Near-Term: Install signage and striping enhancements to increase intersection visibility, including larger signs, crossing markings, additional trail ahead signs, and/or other intersection warning or regulatory signs. Medium-Term/Long-Term: Install an enhanced crossing.	N/A	N/A	N/A	$80,000	$0	ODOT	ODOT
P-2	Construct shared-use path on Chiloquin Hwy	Between US97 and OR422	N/A	N/A	N/A	$4,370,000	$437,000	Klamath Tribes	Klamath Tribes

Project ID	Project Name	Description	Segment Length (ft)	Current Width (ft)	Planned Width (ft)	Planning-Level Cost Estimate[1]	Expected County Contribution[2]	Funding Partner[2]	Lead Agency[2]
P-3	Install mid-block crossing on Chiloquin Hwy	Install crossing between the Tribal Administration Building and the Wellness Center	N/A	N/A	N/A	$710,000	$71,000	Klamath Tribe	Klamath Tribes
P-4	Resurface shared-use path on OR140 in Bly	Resurface path from Fire Station to Edsall Street	2,200	0	10	$330,000	$0	ODOT	ODOT
P-5	Construct shared-use path from OR140 to Community School in Bly	Construct path on westside of the CR504 and Metler Street	1,800	0	10	$450,000	$45,000	ODOT	ODOT
P-7	Construct sidewalk on southside of OR140 in Beatty	Construct sidewalk on southside of OR140 between Yellow Jacket Springs Road and Hutchinson Road	350	0	6	$40,000	$0	ODOT	ODOT
P-8	Construct sidewalk in Sprague River	Construct sidewalk on both sides of Sprague River Road between Main Street (N) and Main Street (S)	700	0	6	$170,000	$170,000	N/A	County
P-9	Construct sidewalk on OR66 in Keno	Construct sidewalk on both sides of OR66 between Needle Dam Road and River Street	1,900	0	6	$460,000	$0	ODOT	ODOT
P-10	Construct sidewalk on Keno Worden Road	Construct sidewalk on both sides of Keno Worden Road between OR66 and Folley Lane	1,500	0	4	$370,000	$370,000	N/A	County
P-11	Construct sidewalk on US97 in Chemult	Construct sidewalk on the west side of US97 between Fire Station and 900 feet south of 1st Street	2,500	0	4	$305,000	$0	ODOT	ODOT
P-12	Enhanced crossing on OR140 at OC&E Trail - Olene	Near-Term: Install signage and striping enhancements to increase intersection visibility, including larger signs, crossing markings, additional trail ahead signs, and/or other intersection warning or regulatory signs. Medium-Term/Long-Term: Install an enhanced crossing.	N/A	N/A	N/A	$80,000	$0	ODOT	ODOT
P-13	ADA ramp installation program	Program to install ADA ramps where they are missing or improve ramps where they are in poor condition	N/A	N/A	N/A	$200,000 ($10,000 annually)	$200,000 ($10,000 annually)	-	County
P-6	Enhanced crossing on US 97 in Crescent	Near-Term: Conduct a pedestrian crossing study Medium-Term/Long-Term: Construct enhanced pedestrian crossing per pedestrian crossing study recommendation	N/A	N/A	N/A	Near-Term: $25,000 Medium-Term: $500,000	$0	ODOT	ODOT
P-14	Enhanced crossing on US 97 in Chemult	Near-Term: Conduct a pedestrian crossing study Medium-Term/Long-Term: Construct enhanced pedestrian crossing per pedestrian crossing study recommendation	N/A	N/A	N/A	Near-Term: $25,000 Medium-Term: $500,000	0	ODOT	ODOT
B-1	Widen Shoulders on Clover Creek Road	Widen shoulders where they are less than 6 feet on Clover Creek Road between OR66 and Dead Indian Road	114,000	4	12	$21,470,000	$21,470,000	N/A	County
B-2	Widen Shoulders on OR140 west of Westside Road	Widen shoulders where they are less than 6 feet on OR140 between Greylock Way and FR 3610	50,000	4	6	$0	$0	ODOT	ODOT

Project ID	Project Name	Description	Segment Length (ft)	Current Width (ft)	Planned Width (ft)	Planning-Level Cost Estimate[1]	Expected County Contribution[2]	Funding Partner[2]	Lead Agency[2]
B-3	Widen Shoulders on OR140 east of Westside Road	Widen shoulders where they are less than 6 feet on OR140 between Westside Road and Lakeshore Drive	50,000	4	6	$0	$0	ODOT	ODOT
B-4	Widen Shoulders on OR66 and Keno Worden Road	Widen shoulders where they are less than 6 feet on OR66 and Keno Worden Road between Bill Scholter Sportsman Park and US97	66,000	4	12	$0	$0	ODOT	ODOT
B-5	Widen Shoulders on OR140 east of Klamath Falls UGB	Widen shoulders where they are less than 6 feet on OR140 between Klamath Falls UGB and Bly	185,250	4	12	$0	$0	ODOT	ODOT
B-6	Widen Shoulders on Bliss Road	Widen shoulders where they are less than 6 feet on Bliss Road between Sprague River Road and OR140	85,000	4	12	$16,730,000	$16,730,000	N/A	County
B-7	Widen Shoulders on Sprague River Road	Widen shoulders where they are less than 6 feet on Sprague River Road between Bliss Road and US97	135,000	4	12	$26,570,000	$26,570,000	N/A	County
B-8	Widen Shoulders on OR62	Widen shoulders where they are less than 6 feet on OR62 between US97 and Fort Klamath	70,000	4	12		$0	ODOT	ODOT
B-9	Widen Shoulders on OR39	Near-Term: Widen shoulders where they are less than 6 feet on OR39 Klamath Falls UGB and Roberta Drive Medium-Term: Install dedicated facility such as bike lanes, buffered bike lanes, or shared-use path.	17,000	4	16	Near-Term: $3,350,000 Medium-Term: $5,000,000 (Buffered Bike Lane Estimate)	$0	ODOT	ODOT
B-10	Widen Shoulders on OR66 and Keno Worden Road	Widen shoulders where they are less than 6 feet on OR66 between Kern Swamp Road and River Road	19,000	4	12		$0	ODOT	ODOT
B-11	Widen Shoulders on Dead Indian Road	Widen shoulders where they are less than 6 feet on Dead Indian Road between Clover Creek Road and OR140	43,000	4	12	$8,460,000	$8,460,000	N/A	County
B-12	Widen Shoulders on OR138	Widen shoulders on OR138 (Adventure Cycling Route) from US97 to County limit where paved shoulder width is less than 6 feet.	70,500	4	12		$0	ODOT	ODOT
T-1	Upgrade transit fleet vehicles	Upgrade with new technologies, bilingual message boards, and bike racks. Includes review of existing bus storage needs.	N/A	N/A	N/A	$250,000	$0	Basin Transit, Quail Trail, ODOT	
T-2	Expansion of existing services to rural communities	Expand to rural communities, particularly those with underserved populations	N/A	N/A	N/A	$1,000,000	$0	Basin Transit, Quail Trail, ODOT	
T-3	Program to create Periodic meetings amongst transit providers	Set up and conduct meetings with all local transit agencies to improve county transit coordination	N/A	N/A	N/A	$50,000	$0	Basin Transit, Quail Trail, Amtrak, SouthWest POINT, ODOT	
T-4	Study to Develop/expand transit service in North Klamath County	A study to create a route between LaPine and Klamath County/Klamath Falls	N/A	N/A	N/A	$50,000	$0	Basin Transit, Quail Trail, ODOT, CET	
T-5	Increasing Dial-A-Ride	Increase dial-a-ride service range to unincorporated communities and rural areas	N/A	N/A	N/A	$4,000,000	$0	Basin Transit, Quail Trail, ODOT	
T-6	Development of public transportation education resources	Educate the community about connections available within the County to reach key destinations within and connecting to County communities.	N/A	N/A	N/A	$100,000	$0	Basin Transit, Quail Trail, ODOT	
T-7	Update BTS Plan	Update the Basin Transit Service Transit Master Plan.	N/A	N/A	N/A	$100,000	$0	Basin Transit	
D-1	Bridge Rehabilitation at Matney Way (Lost River) Bridge ID: 35C211	Structural Deficiency	N/A	N/A	N/A	$690,000	$690,000	N/A	County
D-2	Bridge Replacement at W Langell Valley Rd (Irrigation canal) Bridge ID: 18C011	Structural Deficiency	N/A	N/A	N/A	$260,000	$260,000	N/A	County

Project ID	Project Name	Description	Segment Length (ft)	Current Width (ft)	Planned Width (ft)	Planning-Level Cost Estimate[1]	Expected County Contribution[2]	Funding Partner[2]	Lead Agency[2]
D-3	Bridge Rehabilitation at Ivory Pine Rd (Meryl Creek) Bridge ID: 35C223	Structural Deficiency	N/A	N/A	N/A	$280,000	$280,000	N/A	County
D-4	Bridge Rehabilitation at Dodds Hollow (Irrigation canal) Bridge ID: 35C124	Structural Deficiency	N/A	N/A	N/A	$470,000	$470,000	N/A	County
D-5	Bridge Rehabilitation at I O O F Cemetery Rd (Irrigation canal) Bridge ID: 35C145	Structural Deficiency	N/A	N/A	N/A	$390,000	$390,000	N/A	County
D-6	Bridge Rehabilitation at Washburn Way (Irrigation canal) Bridge ID: 35C342	Structural Deficiency	N/A	N/A	N/A	$460,000	$460,000	N/A	County
D-7	Bridge Rehabilitation Study at Reeder Road (Lost River) Bridge ID: 8105	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$50,000	$50,000	N/A	County
D-8	Bridge Rehabilitation at Crescent Cutoff Road (Little Deschutes River) Bridge ID: 9027	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$110,000	$110,000	N/A	County
D-9	Bridge Rehabilitation at Gift Road (Lost River) Bridge ID: 18C26A	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$520,000	$520,000	N/A	County
D-10	Bridge Replacement at Cambell Road (Ditch) Bridge ID: 35C117	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$360,000	$360,000	N/A	County
D-11	Bridge Replacement at Swan Lake Road (Drainage Ditch) Bridge ID: 35C197	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$270,000	$270,000	N/A	County
D-12	Bridge Replacement at Ivory Pine Road (S Sprague River) Bridge ID: 35C219	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$1,070,000	$1,070,000	N/A	County
D-13	Bridge Replacement at Sprague River Road (Whiskey Creek) Bridge ID: 18C009	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$250,000	$250,000	N/A	County
D-14	Bridge Replacement at Langell Valley Road (Lost River) Bridge ID: 18C017	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$1,640,000	$1,640,000	N/A	County
D-15	Bridge Rehabilitation at Spring Lake Road (Drain Ditch) Bridge ID: 18C020	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$390,000	$390,000	N/A	County
D-16	Bridge Replacement at Homedale Road (Irrigation Canal) Bridge ID: 35C143	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$290,000	$290,000	N/A	County
D-17	Bridge Rehabilitation at McQuiston Road (Seven Mile Canal) Bridge ID: 35C154	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$760,000	$760,000	N/A	County

Project ID	Project Name	Description	Segment Length (ft)	Current Width (ft)	Planned Width (ft)	Planning-Level Cost Estimate[1]	Expected County Contribution[2]	Funding Partner[2]	Lead Agency[2]
D-18	Bridge Replacement Matney Road (Irrigation Canal) Bridge ID: 35C157	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$380,000	$380,000	N/A	County
D-19	Bridge Replacement at Weed Road (Wood River) Bridge ID: 35C206	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$1,150,000	$1,150,000	N/A	County
D-20	Bridge Rehabilitation at Gerber Road (Irrigation Canal) Bridge ID: 35C217	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$100,000	$100,000	N/A	County
D-21	Bridge Replacement at Gerber Road (Ben Hall Creek) Bridge ID: 35C218	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$450,000	$450,000	N/A	County
D-22	Bridge Replacement at Langell Valley Road (Lost River) Bridge ID: 8592	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$1,540,000	$1,540,000	N/A	County
D-23	Bridge Replacement at Short Road (Canal) Bridge ID: 18C21A	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$960,000	$960,000	N/A	County
D-24	Bridge Rehabilitation at Anderson Road (Irrigation Canal) Bridge ID: 35C146	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$220,000	$220,000	N/A	County
D-25	Bridge Replacement at Poe Valley Road (Harpold Dam-Lost River) Bridge ID: 35C168	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$870,000	$870,000	N/A	County
D-26	Bridge Rehabilitation at Holl Road (Low Line Canal) Bridge ID: 35C186	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$80,000	$80,000	N/A	County
D-27	Bridge Replacement at Stateline Road (J-11 Lateral) Bridge ID: 35C193	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$190,000	$190,000	N/A	County
D-28	Bridge Replacement at Saddle Mount Pit Road (Sprague River) Bridge ID: 35C225	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$990,000	$990,000	N/A	County
D-29	Bridge Replacement at Poe Valley Road (F Canal) Bridge ID: 35C351	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$130,000	$130,000	N/A	County
D-30	Bridge Replacement at Silver Lake Road (Cattle Pass) Bridge ID: 35C354	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$160,000	$160,000	N/A	County
D-31	Bridge Replacement at Hill Road (Irrigation Canal) Bridge ID: 35C138	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$240,000	$240,000	N/A	County
D-32	Bridge Replacement at Joe Wright Road (A-3 Irrigation) Bridge ID: 35C215	10-year Bridge Rehab/ Replace Project List	N/A	N/A	N/A	$250,000	$250,000	N/A	County
D-33	Bridge Replacement at OR58 (Railroad MP 82.4) Bridge ID: 02452A	2010 Klamath County TSP	N/A	N/A	N/A	$6,820,000	$0	ODOT, Klamath Northern Rail	ODOT

APPENDIX 1C
URBAN AREA PROJECT SUMMARY TABLES

ID	Project Name	Description	Source	2020 Cost	2020 Cost (Rounded)	County Contribution	Year of Estimate	Priority	Funding Scenario Category	Source Category	Assume ODOT funding partner?	ID Number from County's Spreadsheet
SA6	Safety Improvements on Shasta Way from Washburn Way to Crater Lake Parkway (OR 39)	Conduct a focused safety study of the segment in conjunction with Project I4. Focus of study to identify contributing factors to crashes and determine potential countermeasures to reduce crashes.	TSP	$63,000	$60,000	$60,000	2012	Medium	TSP Project - Signing / Striping	Urban TSP		
SA7	Safety Improvements at Crater Lake Parkway (OR 39) & Eberlein Avenue	Conduct sight distance and speed studies to determine adequate sight distance for prevailing speeds. Consult and apply treatments from the Highway Safety Manual, NCHRP 613 Guidelines for Selection of Speed Reduction Treatments at High Speed Intersections and other similar resources as appropriate. Evaluate possible realignment options.	TSP	$38,000	$40,000	$20,000	2012	Low	TSP Project - Signing / Striping	Urban TSP	Yes	
R5	Strickland Way	East/West new Road from Summers Lane northern extension to Homedale northern extension	County	$2,509,470	$2,510,000	$2,510,000	2020	Low	TSP Project - Future	County - Future Expansion		F11
R6	Summers Ln Extension	New Road from Foothills Boulevard to UGB (North)	County	$3,645,833	$3,650,000	$3,650,000	2020	Low	TSP Project - Future	County - Future Expansion		F4
R7	Maywood Dr Extension	New Road from Crosby Avenue to Main Street	County	$1,799,242	$1,800,000	$1,800,000	2020	Medium	TSP Project - Future	County - Future Expansion		F10
R10	Hilyard Extension 1	Rebuild 1,050 ln. ft. of roadway between Patterson Street to dead end	County	$696,023	$700,000	$700,000	2020	Medium	TSP Project - Existing	County - Existing System		E14
R11	LaHabra Way	New Road from Verda Vista Drive to Hilyard Avenue	County	$1,041,667	$1,040,000	$1,040,000	2020	Medium	TSP Project - Future	County - Future Expansion		F5
R12	Washburn Way Realignment	Would realign Washburn Way to connect with Joe Wright Road east of the railroad track alignment	TSP	$3,026,000	$3,030,000	$3,030,000	2012	Low	TSP Project - Future	Urban TSP		
R13	Brett Way Extension			-		$0	-		TSP Project - Future	County - Future Expansion		F1
R17	Orindale Road Upgrade	Would upgrade Orindale Road to an urban minor collector	TSP	-		$0	-	Vision	TSP Project - Existing	Urban TSP		
R18	Balsam Drive Upgrade	Would upgrade Balsam Drive to an urban minor collector	TSP	-		$0	-	Vision	TSP Project - Existing	Urban TSP		
R20	New Minor Collector Construction	Would construct a new minor collector between Emerald Street and planned roadway south of the OR 140/OR 66 intersection	TSP	-		$0	-	Vision	TSP Project - Future	Urban TSP		
R21	Anderson Avenue Extension	Would extend Anderson Avenue from Gettle Street to Glenwood Drive	TSP			$0		Vision	TSP Project - Future	Urban TSP		
R22	Laverne Ave Rebuild	Rebuild 1,300 ln. ft. of roadway between Altamont Drive and Crest Street	County	$861,742	$860,000	$860,000	2020	High	TSP Project - Existing	County - Existing System		E1
R23	Homedale Rd Rebuild 1	Rebuild 2,700 ln. ft. of roadway between Shasta Way and Shaylnn Drive	County	$1,789,773	$1,790,000	$1,790,000	2020	High	TSP Project - Existing	County - Existing System		E3
R24	Summers Ln Rebuild	Rebuild 1,300 ln. ft. of roadway between Frieda Avenue to Shasta Way	County	$861,742	$860,000	$860,000	2020	High	TSP Project - Existing	County - Existing System		E6
R25	Hilyard Ave Rebuild	Rebuild 2,000 ln. ft. of roadway between 6th Street and Siera Heights Drive	County	$1,325,758	$1,330,000	$1,330,000	2020	Medium	TSP Project - Existing	County - Existing System		E7
R26	Altamont Rebuild	Rebuild 4,050 ln. ft. of roadway between OR140 and Barry Avenue	County	$2,684,659	$2,680,000	$2,680,000	2020	Medium	TSP Project - Existing	County - Existing System		E8
R27	Homedale Rd Rebuild 2	Rebuild 1,400 ln. ft. of roadway between OR140 and Airway Drive	County	$928,030	$930,000	$930,000	2020	Medium	TSP Project - Existing	County - Existing System		E9
R28	Keller Rd Rebuild	Rebuild 2,800 ln. ft. of roadway between La Habra Way and OR39	County	$1,856,061	$1,860,000	$1,860,000	2020	Medium	TSP Project - Existing	County - Existing System		E10
R29	Maywood Dr Rebuild	Rebuild 2,200 ln. ft. of roadway between Crosby Avenue and Hilyard Avenue	County	$1,458,333	$1,460,000	$1,460,000	2020	Medium	TSP Project - Existing	County - Existing System		E11
R30	Shasta Way Rebuild	Rebuild 2,550 ln. ft. of roadway between Patterson Street and Kimberly Drive	County	$1,690,341	$1,690,000	$1,690,000	2020	Low	TSP Project - Existing	County - Existing System		E12
R31	Madison St Rebuild	Rebuild 1,800 ln. ft. of roadway between Shasta Way and dead end	County	$1,193,182	$1,190,000	$1,190,000	2020	Low	TSP Project - Existing	County - Existing System		E13
R32	Harlan / Homedale Inersection	Reconstruct intersection	County	$1,000,000	$1,000,000	$1,000,000	2020	High	TSP Project - Existing	County - Existing System		E15
R33	Degroot/Washburn Intersection	Reconstruct intersection	County	$1,000,000	$1,000,000	$1,000,000	2020	Medium	TSP Project - Existing	County - Existing System		E16
R34	Hilyard Ave Extension 2	New Road from Markgraf Lane to UGB	County	$923,295	$920,000	$920,000	2020	Low	TSP Project - Future	County - Future Expansion		F2
R35	Summers Ln Extension	New Road from Marian Court to Foothills Boulevard	County	$757,576	$760,000	$760,000	2020	High	TSP Project - Future	County - Future Expansion		F3
R36	GlennLee Ave	New Road from LaHabra Way to KCC	County	$710,227	$710,000	$710,000	2020	Medium	TSP Project - Future	County - Future Expansion		F6
R37	Madison St Extension	New Road from Springcrest Way to existing roadway 1,400 feet south	County	$402,462	$400,000	$400,000	2020	Medium	TSP Project - Future	County - Future Expansion		F7
R38	Sturdivant Extension	New Road from Lombardi Drive to Keller Road	County	$3,828,598	$3,830,000	$3,830,000	2020	Medium	TSP Project - Future	County - Future Expansion		F8
R39	Homedale Rd Extension	New Road from Foothills Boulevard to Old Fort Road	County	$5,397,727	$5,400,000	$5,400,000	2020	Low	TSP Project - Future	County - Future Expansion		F9
R40	Foothills Intersection Improvement	Intersection improvement at Summers lane extension and Foothills Boulevard	County	$1,000,000	$1,000,000	$1,000,000	2020	High	TSP Project - Existing	County - Future Expansion		F12
R41	Shasta View Blvd Intersection Improvement	Intersection improvement at Foothills Boulevard and Steen Sports Park entrance	County	$1,000,000	$1,000,000	$1,000,000	2020	High	TSP Project - Existing	County - Future Expansion		F13
R42	Eberlein Avenue Extension	New Road from 6th Street to Foothills Boulevard	County	$1,722,538	$1,720,000	$1,720,000	2020	Low	TSP Project - Future	County - Future Expansion		F14
R43	Old Fort Road Improvements	New Road	County	$5,033,144	$5,030,000	$5,030,000	2020	Low	TSP Project - Future	County - Future Expansion		F15
R44	Collman Dairy Extension	New Road	County	$8,250,000	$8,250,000	$8,250,000	2020	Low	TSP Project - Future	County - Future Expansion		F16
R45	Algoma Re-alignment**	New Road	County	$3,877,273	$3,880,000	$3,880,000	2020	Medium	TSP Project - Future	County - Future Expansion		F17
R46	Shady Pine Realignment**	New Road	County	$1,231,061	$1,230,000	$1,230,000	2020	Medium	TSP Project - Future	County - Future Expansion		F18
I5	Eberlein Avenue/Crater Lake Parkway (OR 39) Intersection	Complete intersection traffic control evaulation to identify an appropriate intersection improvement	TSP	$75,000	$80,000	$40,000	2012	Low	TSP Project - Existing	Urban TSP	Yes	
I6	Crater Lake Parkway (OR 39)/Shasta Way Intersection	Install new traffic signal	TSP	$2,000,000	$2,000,000	$1,000,000	2012	Low	TSP Project - Existing	Urban TSP	Yes	
I7	Traffic Signal at Homedale Rd/Shasta Rd	Install traffic signal	County	$0	$0	$0	2020	Vision	TSP Project - Existing	County - Existing System		E4
I8	Homedale Road/S 6th Street (OR 39) Intersection	Construct eastbound right-turn lane and install new traffic signal	TSP	$2,000,000	$2,000,000	$1,000,000	2012	Medium	TSP Project - Existing	Urban TSP	Yes	
I18	Greensprings Drive/Dover Avenue/Riverside Drive Improvements	Would reconstruct the existing 5-legged intersection	TSP	-		$0	-	Vision	TSP Project - Existing	Urban TSP		
I21a	Orindale Road IAMP Study	Conduct an Interchange Area Master Plan (IAMP) for OR140/Orindale Road	TSP	$75,000	$75,000	$0		Low	TSP Project - Existing	Urban TSP		
I21b	Orindale Road Interchange	Would construct an interchange at the Orindale Road/OR 140 intersection	TSP			$0		Vision	TSP Project - Existing	Urban TSP	Yes	

ID	Project Name	Description	Source	2020 Cost	2020 Cost (Rounded)	County Contribution	Year of Estimate	Priority	Funding Scenario Category	Source Category	Assume ODOT funding partner?	ID Number from County's Spreadsheet
P5	Stearns Corridor / Clinton Ave Rebuild	Rebuild 3,100 ln. ft. of Crest Street, including sidewalks on both sides of the road, between Hilyard Avenue and Clinton Avenue / Rebuild 1,300 ln. ft. of roadway between Crest Street and Summers Lane	County	$2,054,924	$2,050,000	$2,050,000	2020	High	TSP Project - Pedestrian Crossing, Sidewalk, or Path	County - Existing System		E2
				$861,742	$860,000	$860,000		Low	TSP Project - Pedestrian Crossing, Sidewalk, or Path	County - Existing System		E5

APPENDIX 1D

FINANCIAL SCENARIOS

TRANSPORTATION IMPROVEMENT PROGRAM - FY2020 TO FY2039
RESOURCE AND REQUIRMENTS SCENARIOS

Assumed Inflation: 3%

REQUIREMENTS	Total County TSP (County Funding Only)	High Priority County TSP	BASELINE: 2008-2018 ACTUAL AVERAGE SPENDING NEG $85 mil Reserve		SCENARIO 1 - NO DEFERRED MAINTENANCE AND TSP, NEG $363 mil Reserve		SCENARIO 2 - REVENUE CONSTRAINED 75 mil Reserve (No TSP Projects)		SCENARIO 3 - 28.5 mil Reserve (High Priority Projects)	
PRESERVATION			FY 20: 2019-2020 (Typical Year)	FY2020 - FY2039 (with Inflation)	FY 20: 2019-2020 (Typical Year)	FY2020 - FY2039 (with Inflation)	FY 20: 2019-2020 (Typical Year)	FY2020 - FY2039 (with 3% inflation)	FY 20: 2019-2020 (Typical Year)	FY2020 - FY2039 (with 3% inflation)
Chip Seal	N/A	N/A	$ 3,320,377	$ 89,219,773	$ 6,100,000	$ 163,909,284	$ 2,250,000	$ 60,458,343	$ 3,000,000	$ 80,611,123
Skinny Patch	N/A	N/A	$ 40,377	$ 1,084,945	$ 300,000	$ 8,061,112	$ 285,000	$ 7,658,057	$ 500,000	$ 13,435,187
Overlay	N/A	N/A	$ 338,357	$ 9,091,779	$ 250,000	$ 6,717,594	$ 150,000	$ 4,030,556	$ 250,000	$ 6,717,594
TOTALS	**N/A**	**N/A**	***$ 3,699,111***	***$ 99,396,498***	***$ 6,650,000***	***$ 178,687,990***	***$ 2,685,000***	***$ 72,146,956***	***$ 3,750,000***	***$ 100,763,904***
Deferred Maintenance				*$ 79,291,493*		**$** -		*$ 106,541,035*		*$ 77,924,086*
PCI				*81*		*84*		*62*		*72*
Bridge Program			**2019-2020**	**2020-2039**	**2019-2020**	**2020-2039**	**2019-2020**	**2020-2039**	**2019-2020**	**2020-2039**
Minor Bridge Repair	N/A	N/A	$ 76,024	$ 2,042,793	$ 300,000	$ 8,061,112	$ 200,000	$ 5,374,075	$ 225,000	$ 6,045,834
Bridge Replace & Rehabilitation	$ 32,000,000.00	$ 15,970,000.00	$ 1,574,281	$ 42,301,520	$ 1,600,000	$ 42,992,599	$ 750,000	$ 20,152,781	$ 798,500	$ 21,455,994
TOTALS	**$ 32,000,000.00**	**$ 15,970,000.00**	***$ 1,650,305***	***$ 44,344,313***	***$ 1,900,000***	***$ 51,053,712***	***$ 950,000***	***$ 25,526,856***	***$ 1,023,500***	***$ 27,501,828***
Deferred Maintenance				*$ 249,695*		*$* -		*$ 25,526,856*		*$ 23,551,883*
Legal Truck Posted Structures				*8*		*0*		*20*		*14*
Enhance (Roadway & ITS)			**2019-2020**	**2020-2039**	**2019-2020**	**2020-2039**	**2019-2020**	**2020-2039**	**2019-2020**	**2020-2039**
County TSP Projects	$ 172,000.00	$ 114,000.00	$ -	$ -	$ 8,600.00	$ 231,085	$ -	$ -	$ 5,700	$ 65,344
Urban Area TSP Projects	$ 5,405,000.00	$ 255,000.00	$ -	$ -	$ 270,250	$ 7,261,719	$ -	$ -	$ 12,750	$ 146,164
Urban Vision Projects (Existing System)	$ 20,260,000.00	$ 6,560,000.00	$ 866,891	$ 23,293,686	$ 1,013,000	$ 27,219,689	$ -	$ -	$ 328,000	$ 3,760,152
Urban Vision Projects (Future)	$ 43,130,000.00	$ 2,760,000.00	$ -	$ -	$ 2,156,500	$ 57,945,963	$ -	$ -	$ 138,000	$ 1,582,015
TOTALS	**$ 68,967,000.00**	**$ 9,320,000.00**	**$ 866,891**	**$ 23,293,686**	**$ 3,448,350**	**$ 92,658,456**	**$ -**	**$ -**	**$ 484,450**	**$ 5,553,676**
20-Year Projects Remaining				*N/A*		*$* -		*$ 92,658,456*		*$ 87,104,780*
Safety			**2019-2020**	**2020-2039**	**2019-2020**	**2020-2039**	**2019-2020**	**2020-2039**	**2019-2020**	**2020-2039**
Urban Safety Improvements	N/A	N/A	$ -	$ -	$ 125,000	$ 3,358,797	$ 25,000	$ 671,759	$ 50,000	$ 1,343,519
County TSP Projects	$ 1,239,000.00	$ 632,000.00	$ -	$ -	$ 61,950	$ 1,664,620		$ -	$ 31,600	$ 849,104
TOTALS	**$ 1,239,000.00**	**$ 632,000.00**	**$ -**	$ -	**$ 186,950**	$ 5,023,417	**$ 25,000**	$ 671,759	**$ 50,000**	$ 1,343,519
Crossings Improved						*20*		*4*		*8*
Bicycle and Pedestrian			**2019-2020**	**2020-2039**	**2019-2020**	**2020-2039**	**2019-2020**	**2020-2039**	**2019-2020**	**2020-2039**
Urban ADA Ramps	N/A	N/A	$ 16,160	$ 434,225	$ 256,500	$ 6,892,251	$ 50,000	$ 1,343,519	$ 125,000	$ 3,358,797
County Mulit-Modal TSP Projects	$ 74,523,000.00	$ 271,000.00	$ -	$ -	$ 3,726,150	$ 100,123,046			$ 13,550	$ 364,094
TOTALS	**$ 74,523,000.00**	**$ 271,000.00**	***$ 16,160***	$ 434,225	***$ 3,982,650***	**$ 107,015,297**	***$ 50,000***	**$ 1,343,519**	***$ 138,550***	**$ 3,722,890**
Replaced Ramps				*20*		*570*		*57*		*260*
Operations & Other Maintenance			**2019-2020**	**2020-2039**	**2019-2020**	**2020-2039**	**2019-2020**	**2020-2039**	**2019-2020**	**2020-2039**
Equipment	N/A	N/A	$ 857,059	$ 23,029,496	$ 850,000	$ 22,839,818	$ 725,000	$ 19,481,022	$ 800,000	$ 21,496,300
Aggregate	N/A	N/A	$ 568,469	$ 15,274,975	$ 1,000,000	$ 26,870,374	$ 600,000	$ 16,122,225	$ 600,000	$ 16,122,225
Snow Removal	N/A	N/A	$ 752,468	$ 20,219,097	$ 775,000	$ 20,824,540	$ 650,000	$ 17,465,743	$ 760,000	$ 20,421,485
Other	N/A	N/A	$ 2,500,000	$ 67,175,936	$ 2,500,000	$ 67,175,936	$ 2,250,000	$ 60,458,343	$ 2,350,000	$ 63,145,380
TOTALS	**N/A**	**N/A**	***$ 4,677,996***	**$ 125,699,504**	***$ 5,125,000***	**$ 137,710,669**	***$ 4,225,000***	**$ 113,527,332**	***$ 4,510,000***	**$ 121,185,389**
Policy Revision (Snow, Fleet, Other)				*No*		*No*		*Yes*		*Yes*
Special Projects (Historical)			**2019-2020**	**2020-2039**	**2019-2020**	**2020-2039**	**2019-2020**	**2020-2039**	**2019-2020**	**2020-2039**
Law Enforcement	N/A	N/A	$ 1,500,000	$ 40,305,562	$ 1,500,000	$ 40,305,562	$ -	$ -	$ -	$ -
City/County Schools	N/A	N/A	$ 500,000	$ 13,435,187	$ 500,000	$ 13,435,187	$ -	$ -	$ -	$ -
ODOT/Match	N/A	N/A	$ 500,000	$ 13,435,187	$ 500,000	$ 13,435,187	$ -	$ -	$ -	$ -
City Roads	N/A	N/A	$ 500,000	$ 13,435,187	$ 500,000	$ 13,435,187	$ -	$ -	$ -	$ -
TOTALS	**N/A**	**N/A**	**$ 3,000,000**	**$ 80,611,123**	**$ 3,000,000**	**$ 80,611,123**	**$ -**	**$ -**	**$ -**	**$ -**
Funding Available				*Yes*		*Yes*		*No*		*No*
TOTAL REQUIREMENTS	**$ 176,729,000.00**	**$ 26,193,000.00**	***$ 13,910,463***	***$ 373,779,350***	***$ 24,292,950***	***$ 652,760,664***	***$ 7,935,000***	**$ 213,216,422**	***$ 9,956,500***	**$ 260,071,207**
RESOURCES										
Source			**2019-2020**	**2020-2039**	**2019-2020**	**2020-2039**	**2019-2020**	**2020-2039**	**2019-2020**	**2020-2039**
Reserve as of 12/31/20				$ 76,000,000		$ 76,000,000		$ 76,000,000		$ 76,000,000
20 year gas tax revenue w/HB2017			$ 6,000,000	$ 140,125,000	$ 6,000,000	$ 140,125,000	$ 6,000,000	$ 140,125,000	$ 6,000,000	$ 140,125,000
State Transportation Block Grant			$ 568,750	$ 15,843,750	$ 568,750	$ 15,843,750	$ 568,750	$ 15,843,750	$ 568,750	$ 15,843,750
20 year SRS (Assumed Diminishing)			$ 3,900,000	$ 34,600,000	$ 3,900,000	$ 34,600,000	$ 3,900,000	$ 34,600,000	$ 3,900,000	$ 34,600,000
Interest			$ 500,000	$ 10,000,000	$ 500,000	$ 10,000,000	$ 500,000	$ 10,000,000	$ 500,000	$ 10,000,000
Other Sources			$ 600,000	$ 12,000,000	$ 600,000	$ 12,000,000	$ 600,000	$ 12,000,000	$ 600,000	$ 12,000,000
TOTALS			***$ 11,568,750***	**$ 288,568,750.00**	***$ 11,568,750***	**$ 288,568,750.00**	***$ 11,568,750***	**$ 288,568,750.00**	***$ 11,568,750***	**$ 288,568,750.00**
TOTAL RESOURCES				**$ 288,568,750**		**$ 288,568,750**		**$ 288,568,750**		**$ 288,568,750**
TOTAL REQUIREMENTS				**$ 373,779,350**		**$ 652,760,664**		**$ 213,216,422**		**$ 260,071,207**
RESERVE BALANCE				**$ (85,210,600)**		**$ (364,191,914)**		**$ 75,352,328**		**$ 28,497,543**
Approximate Technical FTE				*8*		*13*		*6*		*7*

APPENDIX 1E

COMPREHENSIVE PLAN & LAND DEVELOPMENT CODE AMENDMENTS

MEMORANDUM

Klamath County Transportation System Plan Implementation (Task 7.3)

Klamath County Transportation System Plan

DATE	May 13, 2021
TO	Project Management Team
FROM	Darci Rudzinski & Clinton "CJ" Doxsee, APG
CC	Ashleigh Ludwig, KAI

OVERVIEW

This memorandum outlines an approach for amending Klamath County's regulations to incorporate the goals, objectives, and improvements identified in the Klamath County Transportation System Plan (TSP) update. Regulatory provisions identified in this memorandum include the Klamath County Comprehensive Plan and the Land Development Code (LDC). The proposed amendments are also intended to be consistent with the Oregon Transportation Planning Rule (OAR 660, Division 12, or "TPR").

The adoption of the TSP update and the associated amendments will also precede the adoption of the Road Design and Construction Standards, which is currently in development by the Public Works Department. This memorandum provides general guidance for County Staff to consider as the Road Design and Construction Standards document is finalized to ensure consistency with the recommended amendments identified in this memorandum as well as the updated TSP.

The TSP update will comprehensively update the County's current TSP, adopted in 2010. The updated TSP establishes the County's goals and objectives for developing and improving the transportation system through the year 2040. The updated TSP will address transportation-related issues for unincorporates areas within the County.

REGULATORY CONTEXT

This section provides a cursory overview of existing or in-progress plans, policies, and guidelines that affect transportation planning in Klamath County. The plans and policies provide guidance and requirements for developing the County's transportation system and help achieve a land use framework that supports the goals of the updated TSP. They include:

- Klamath County Comprehensive Plan (Adopted 1984, Revised 2003)
- Klamath County 2010-2030 Transportation System Plan (2010)
- Klamath County Land Development Code (2018)
- Klamath County Department of Public Works Road Design and Construction Standards (in-progress)

Klamath County Comprehensive Plan (Adopted 1984, Revised 2003)

The Klamath County Comprehensive Plan is the County's long-range planning guide for unincorporated County areas. Its goals, policies, and implementation provide direction on the transportation system and land use decision-making, consistent with Statewide Planning Goals.

The transportation policies in the adopted Comprehensive Plan are established under Goal 12: Transportation. Note, the Comprehensive Plan document was last revised in 2003, however, the Klamath County 2010-2030 Transportation System Plan, adopted in 2010, includes ordinance language that modifies elements of the Comprehensive Plan.

Klamath County 2010-2030 Transportation System Plan (2010)

The Klamath County 2010-2030 Transportation System Plan establishes the County's goals and objectives for developing and improving the transportation system through the year 2030. It includes transportation-related issues for unincorporated areas within the County as well as the incorporated cities of Chiloquin, Bonanza, Merrill, and Malin. The 2010-2030 Transportation System Plan is an adopted element of the Comprehensive Plan.

Klamath County Land Development Code

The Klamath County Land Development Code (LDC) regulates development within unincorporated Klamath County and implements the Klamath County Comprehensive Plan and adopted TSP. The LDC contains several requirements that address the relationship between land use development and transportation system development. Most transportation-related standards are provided in Chapter 70 – Public Works Department Standards and regulate street access/connectivity, bicycle and pedestrian access/connectivity, street design standards, parking, performance standards, and traffic impact study requirements.

The Klamath County Public Works Department's street construction drawings are provided in Appendix A of the LDC. The drawings illustrate the minimum specifications allowable for roads constructed under the County's jurisdiction. The appendix includes street cross-section standard

drawings for Collector, Local, Residential, Gravel, and Graded roads. The appendix does not include cross-section standard drawings for Arterial roads.

Klamath County Department of Public Works Road Design and Construction Standards (in-progress)

Klamath County's Public Works Department is currently developing a Road Design and Construction Standards document. The goal is to have a consolidated set of uniform standards and procedures for the development and construction of the County's public facilities, including County roadways.

The guideline document is not expected to be completed prior to the adoption of the TSP, but ultimately will be consistent with updated roadway standards in the TSP. The draft Road Design and Construction Standards available include three chapters, listed below. County staff plan to draft additional chapter to address other facilities maintained by the Public Works Department.

- Chapter 1 – General Considerations
- Chapter 2 – Road Types and Geometrics[1]
- Chapter 3 – Non-Vehicle Roadway Improvements

The primary purpose of the recommendations identified in this memorandum seek to implement the updated TSP, in compliance with the TPR. Recommendations also anticipate that the more detailed engineering specifications and drawings will be removed from the LDC and will ultimately reside in the Road Design and Construction Standards. Recommendations are proposed to LDC Chapter 70 – Public Works Development Standards that ensure consistency with the update TSP (and TPR); portions of Chapter 70 are also intended to be moved to the guidelines document.

POLICY AND CODE AMENDMENT SUMMARY

Klamath County will need to amend its land use regulations to implement updated transportation standards and to achieve the TSP's goals and objectives. These goals and objectives are achieved through a variety of measures, including street classifications, with corresponding design standards and access control measures; pedestrian and bicycle circulation design and connectivity provisions; minimum parking requirements; and regulations and procedures for protecting the function and capacity of roadways.

The consultant team evaluated the County's Comprehensive Plan, LDC, and (draft) Road Design and Construction Standards to ensure that policies and standards reflect TSP recommendations and are consistent with statewide requirements in the TPR.

[1] A draft of Chapter 2 was included as an attachment to Technical Memorandum #4: Solutions Analysis and Funding Program

The following elements are recommended for amendments.

- **Comprehensive Plan (Chapter 12: Transportation):** update policies in the Comprehensive Plan to be consistent with and implement the updated TSP.
- **Transportation System Plan:** Adopt the 2021 Transportation System Plan by reference as a replacement of the County's current 2010-2030 Transportation System Plan, adopted in 2010.
- **Land Development Code:** Update the LDC to be consistent with and implement the direction provided in the Comprehensive Plan and TSP.

No amendments to the Klamath Falls Urban Area TSP are proposed as part of this project. The updated TSP focuses primarily on unincorporated areas outside of Klamath Falls UGB.[2] Specific projects on County roadways within the Urban Area are included in the TSP update.

Comprehensive Plan

In order to ensure policy consistency, the Klamath County Comprehensive Plan should be updated to incorporate the TSP's goals and objectives. Comprehensive Plan Goal 12 – Transportation should be modified to incorporate the goals, objective, and findings of the TSP.

Attachment A to this memorandum includes recommended amendments to the policy language that would incorporate the TSP's goals and objectives.

Transportation System Plan

It is recommended that the County adopt the updated TSP as a replacement to the TSP that was adopted in 2010. By legislatively adopting the "plan" elements of the TSP, the County will have a policy framework on which to base compliance-related development requirements and to seek public financing for recommended improvements. The TSP will be adopted by reference as the Transportation element of the Comprehensive Plan.

Land Development Code Standards

It is recommended that targeted modifications to the Land Development Code be adopted to ensure consistency with, and to implement, the updated TSP.

Table 1 provides a summary of recommended LDC amendments that can be considered as part of TSP adoption. The amendments in Table 1 are based on the recommendations identified in Technical Memorandum #4: Solutions Analysis and Funding Program. Attachment B includes the

[2] Note, Technical Memorandum #4 identifies a number of projects within the Klamath Falls UGB, including those in the Klamath Falls Urban Area TSP and others since the Urban Area TSP was formally adopted in 2012. These projects have been updated to 2020 dollars. An updates list of cost estimates is provided in Attachment B to that memorandum.

LDC sections subject to the proposed changes, shown as modified, consistent with Table 1 recommendations.

Table 1: Land Development Code Recommendations Summary

Topic	Recommendations	Code Section	Compliance
Conditions of Approval	Include transportation-related improvements as a potential condition of approval – including specifically improvements that facilitate pedestrian and bicycle travel.	LDC 20.040 Conditions of Approval LDC 71.200 Conditions of Approval	-0045(2)(e)
Improvement Procedures	Update provisions to clarify that construction shall not commence until a permit is issued.	LDC 70.030 Improvement Procedures	
Street and Sidewalk Exception	Add approval criteria for exceptions to sidewalk and bikeway requirements.	(new) LDC 71.030.C LDC 71.050 Improvement in the Klamath Falls Urban Area	-0045(3)(b)
Roadway Cross-sections	Update cross-sections and design standards to be consistent with the updated TSP.	LDC 71.040 Minimum Right-of-Way Widths	-0045(7)
PUE Exception	Allow exceptions to the minimum right-of-way width for streets that provide a public utility easement when approved by the Public Works Director.	(new) LDC 71.040.D	-0045(7)
Private Minimum Access Road	Add provision to allow for private minimum access roads where through-access is not required in urban areas. *Note, provisions for private minimum access road includes a restriction on the number of dwellings served. This quantity restriction is based on comparable provisions in other counties and can be adjusted to reflect Klamath County's needs.*	(new) LDC 71.050.E & F	-0045(7)

Topic	Recommendations	Code Section	Compliance
User Maintained Roads	Add provisions for user-maintained roads. *Note, provisions for user-maintained roads include restrictions on the number of dwellings served or the maximum daily traffic. These quantity restrictions are based on comparable provisions in other counties and can be adjusted to reflect Klamath County's needs.*	(new) LDC 71.060.B and C.	-0045(7)
Clerical Updates	Reorganize Sections 71.070 and 71.080 for clarity.	LDC 71.070 Roadway Alignment LDC 71.080 Roadway Grades and Curves	
Cul-de-sacs and Dead-end Streets	Revise cul-de-sac standards to further define requirements between urban and rural areas. Add provisions allowing for temporary cul-de-sacs. Add provisions allowing for dead-end streets.	LDC 71.100 Cul-de-sacs	-0045(3)(b)
Existing Street Requirements	Add provisions to clarify when right-of-way dedication and associated improvements are required for existing streets.	LDC 71.110 Existing Streets	-0045(1)(a)
Street Circulation Requirements	Expand provisions for block to include additional standards for creating interconnected streets.	LDC 71.150 Blocks	-0045(2)(a)
Bicycle and Pedestrian Circulation	Add on-site bicycle and pedestrian circulation standards to facilitate safe and convenient active transportation.	LDC 71.190 Non-vehicular Access and Circulation	-0045(3)(b)
Transit Design Standards	Require new development and redevelopment projects accommodate transit, where the site includes, or is adjacent to, an existing or planned transit stop.	LDC 71.190 Transit Access	-0045(4)(a)
Public Works Standard Drawings	Remove and/or modify standard drawings to be consistent with the revised street design standards provided in the TSP.	Appendix A Klamath County Department of Public Works Standard Drawings	-0045(7)

Table 2 contains LDC Chapter 70 sections or subsections that include the same or similar content as the draft Road Design and Construction Standards. The table identifies which sections or subsections can eventually be removed or simplified in the LDC, either as part of code amendments that will be considered with TSP adoption, or at a later time, when the guidelines are completed.[3] Table 2 also identifies which sections or subsections should be retained, as codified in LDC Chapter 70, in order to be compliant with the TPR and recommendations in the TSP.

Note, recommendations identified in Table 2 assume the guidelines will not be complete until after TSP adoption. For LDC Chapter 70 sections that are recommended for amendments in both Tables 1 and 2, County Staff should consider how LDC amendments that implement the TSP relate/modify the guidelines as they are finalized.

Table 2: Land Development

LDC Section	Draft Road Design and Construction Standards	Notes/Recommendations
71.010 Purpose		The LDC section is not required for TSP implementation or TPR compliance, however it should be retained as a consistent LDC chapter element and for clarity and applicability.
71.020 – Access Standards	2.05 Access Management 3.01 Driveways	The LDC section should be retained (as revised). It implements the TSP's access standards, consistent with the TPR, which requires access control management measures. Construction standard details can be in the Road and Design Construction Standards, consistent with Section 71.020.

[3] Note that the Road Design and Construction Standards document, once completed, will include standards for stormwater, wastewater, grading, etc., and will necessitate other LDC sections to be modified, besides the changes addressed in this memorandum.

LDC Section	Draft Road Design and Construction Standards	Notes/Recommendations
71.030 – General Roadway Design Standards		LDC Subsections A through E (Subsections B.1 through B.8 as revised) and the lists of plan requirements can be removed and added to the Road Design and Construction Standards document. The preamble (Subsections A and B, as revised) to the LDC section that generally describes roadway design standards is not necessary for TSP implementation or TPR compliance; however, retaining the preamble (Subsections A and B, as revised) and modifying it to reference the Road Design and Construction Standards document would provide a connection between documents. For example: *All street improvements shall be designed and constructed in accordance with the Department of Public <u>Road Design and Construction Standards</u> ~~Works Standard Drawings. The drawings shall include the following:~~*
71.040 – Minimum Right-of-Way Widths	2.02 Rural Roadway Types and Geometry	Minimum rights-of-way standards (as revised) should be retained in the LDC because they implement the TSP's street design standards in accordance with roadway functional classification. The County should ensure that engineering standards in the Road and Design Construction Standards are consistent with regulations in Section 71.040, as modified.
71.050 – Improvements in the Klamath Falls Urban Area	2.01 Road Classifications	The LDC section (as revised) should be retained to govern improvements on County roadways within the Klamath Falls Urban Area. The County should ensure that the Road Design and Construction Standards are consistent with regulations in Section 71.050.
71.060 – Improvements Outside the Klamath Falls Area	2.01 Road Classifications	The LDC section (as revised) should be retained to govern improvements on County roadways outside the Klamath Falls Urban Area. The County should ensure that the Road Design and Construction Standards are consistent with regulations in Section 71.060.
71.070 – Roadway Alignment		The LDC section could be retained in the LDC or moved to the Road Design and Construction Standards document (Section 2.04).

LDC Section	Draft Road Design and Construction Standards	Notes/Recommendations
71.080 – Roadway Intersection Angles	2.04 Roadway Design Values	The LDC section can be removed; information in the Road Design and Construction Standards document covers the same information in detail.
71.090 – Roadway Grades and Curves	2.04 Roadway Design Values	The LDC section can be removed; information in the Road Design and Construction Standards document covers the same information in detail.
71.100 – Cul-de-Sacs	2.08 Cul-de-sacs and Hammerheads	The LDC section should be retained because it governs the use of land for the specific roadway improvements and implements TPR requirements limiting the use of cul-de-sacs. Additional standards in the Road Design and Construction Standards can provide construction standards and dimensional requirements that are consistent with LDC Section 71.100.
71.110 – Existing Streets	2.06.B Frontage Improvements	The LDC section should be retained because it governs the use of land for the specific roadway improvements and implements TPR requirements for dedicating necessary right-of-way, consistent with adopted street design standards. Construction standard details can be in the Road and Design Construction Standards, consistent with Section 71.110.
71.120 – Reserve Strips and Street Plugs		The LDC section should be retained because it implements connectivity objectives and TPR requirements for allowing the extension of streets to adjoining properties.
71.130 – Future Street Extensions	2.06.B Frontage Improvements	The LDC section should be retained because it implements connectivity objectives and TPR requirements for allowing the extension of streets to adjoining properties. Construction standard details can be in the Road and Design Construction Standards, consistent with Section 71.130.
71.140 – Half Streets	2.06.B Frontage Improvements	The LDC section should be retained because it implements connectivity objectives and TPR requirements. Construction standard details can be in the Road and Design Construction Standards, consistent with Section 71.140.

LDC Section	Draft Road Design and Construction Standards	Notes/Recommendations
71.150 – Blocks		The LDC section should be retained because it addresses access control measures found in TPR requirements.
71.160 – Access Permits	1.09 Type of Permits	This LDC section should be retained because it addresses access control measures found in TPR requirements. Retaining it and modifying the LDC section referencing the Road Design and Construction Standards document would provide a connection between documents. Additional information on access permit review procedures and approval criteria can be provided in the Road Design and Construction Standards.
71.170 – Utility Placement in Right-of-ways		The LDC section can be moved to the Road Design and Construction Standards document.
71.180 – Manufactured/Mobile Home Park Streets		The LDC section can be moved to the Road Design and Construction Standards document.
71.190 – Non-vehicular Access and Circulation		The LDC section should be retained because it implements bicycle/pedestrian circulation goals in the TSP and similar requirements in the TPR. Construction standard details can be in the Road and Design Construction Standards, consistent with Section 71.190.
71.200 – Traffic Impact Study		This LDC section should be retained as a development proposal submittal requirement, consistent with the TPR requirements for protecting the future operation of transportation facilities.
Appendix A – Public Works Standard Drawings		This LDC appendix can be moved to the Road Design and Construction Standards (as revised). The County should ensure that guidelines are consistent with regulations in Appendix A, as modified.

ATTACHMENT A: COMPREHENSIVE PLAN CHAPTER 12: TRANSPORTATION RECOMMENDATIONS

GOAL 5: OPEN SPACE, SCENIC AND HISTORIC AREAS, AND NATURAL RESOURCES

…

28. POLICY: The County shall encourage efficient energy design in and of proposed subdivisions by encouraging proper energy-efficient building design and orientation as well as efficient circulation for vehicles, pedestrians and bicyclists.

…

GOAL 12: TRANSPORTATION

General Discussion

To encourage a safe, convenient and economic transportation system. A transportation plan may:

1. Consider all modes of transportation including mass transit, air, water, pipeline, rail, highway, bicycle and pedestrian.
2. Be based upon an inventory of local, regional and state transportation needs.
3. Conserve energy.
4. Conform with local and regional comprehensive land use plans.

(Each plan shall include a provision for transportation as a key facility.)

Objectives

Encourage coordination with all transportation agencies to plan, construct, and maintain the transportation network.

Coordinate street and highway development so as to enhance overall County development.

Encourage proper design and transportation facilities to ensure maximum safety.

Encourage interrelationships of streets and highways with other modes of transportation.

Strive for equality of service to and from all parts of the County.

Plan for the separation of pedestrian ways and vehicle traffic ways to ensure maximum protection and convenience.

Coordinate proposed plans for truck routes with all related committees, boards, and agencies to minimize traffic hazards and attempt to ensure that such routes are compatible with adjacent land uses.

Coordinate airport locations with existing and future transportation routes as well as land use.

Encourage a balanced system of transportation between air, rail and land for efficient movement of people and goods.

Encourage efficient development and/or expansion of rail services to existing and future industrial land uses.

Definitions:

- Transportation refers to the movement of people and goods.
- Transportation facility refers to one or more transportation facilities that are planned, developed, operated and maintained in a coordinated manner to supply continuity of movement between modes and within and between geographic and jurisdictional areas.
- Mass transit refers to any form of passenger transportation that carries members of the public on a regular and continuing basis.
- Transportation disadvantaged refers to those individuals who have difficulty in obtaining transportation because of their age, income, physical or mental disability.

1. POLICY: A transportation facilities plan and an official map for highways, arterials, and collectors shall be prepared that are consistent with the Klamath Falls Urban Growth Boundary.

   Rationale:

   - To reserve sufficient rights-of-way for future construction and widening of highways, arterials, and collectors.

   Implementation:

   - The County Public Works Department will cause the plan to be prepared.
   - The Board of County Commissioners may adopt the plan following appropriate hearings.

2. POLICY: New, self-contained neighborhood commercial centers shall be encouraged. Such centers should be scaled to the immediate needs of surrounding development and shall be designed to serve the needs of the development so as not to undercut the regional function of existing commercial districts, if applicable.

   Rationale:

- To avoid increasing traffic congestion. Implementation:
- The Land use plan designates commercial land in areas of new development that should be used for neighborhood shopping centers and other local serving commercial uses.

3. POLICY: Patterns of development that generate significant traffic across grade-level railroad crossing shall be avoided whenever possible.

   Rationale:

   - To reduce safety hazards. Implementation:
   - Where possible, the land use plan places lower density residential development only where major destinations (such as employment locations) are across grade-level railroad crossings. Also, wherever possible, the plan uses railroads and major arterials to define the boundaries of service areas for schools, parks, and neighborhood shopping facilities.

4. POLICY: The County shall encourage the extension of rail lines to serve major industrial developments, provided that such rail lines do not disrupt auto traffic or transport hazardous cargoes through residential areas.

   Rationale:

   - To provide current and ensure future occupants of a particular site or industrial park with rail service when requested by occupants and where practical.
   - To provide energy efficient movement of goods (furthers Goal 13).
   - To provide efficient (energy and economically) and safe means of transportation of large, bulky, low-valued, and oversized commodities and products that cannot be transported over highways.
   - To enable shippers to have wider choice of transportation services and thus be in a better bargaining position when negotiating rates with carriers (furthers Goal 9).
   - To enable delivery of goods in period of emergency, strike, or inclement weather when other forms of transportation cannot operate.

   Implementation:

   - The land use plan site industrial and major commercial areas on or adjacent to commercial transportation.

5. POLICY: The width and spacing of driveways along arterials shall be restricted. Where necessary, turning lanes cut out of abutting property or the construction of parallel frontage roads shall be required, if adequately proven to be necessary by the governing body or agency.

Rationale:

- To reduce acceleration, deceleration, and turning movements that reduce the efficiency and safety of arterials.
- To reduce noise from stop-and-go traffic.
- To increase the distance between traffic and nearby land use to mitigate noise impacts.

Implementation:

- The Land Development Code establishes development standards regulating ingress and egress of land uses abutting major arterials.

6. POLICY: Higher density residential development should when feasible, be located within walking distance (1,000 feet to one quarter mile) of major arterials.

Rationale:

- To locate the maximum number of dwelling units within walking distance of arterials in order to facilitate efficient transit services.

Implementation:

- The land use plan should locate, when feasible, higher density residential development near major arterials, and the Land Development Code shall require pedestrian walkway along future streets.

7. POLICY: ~~The County shall encourage local governments to improve the convenience and safety of pedestrian and bicycle transportation.~~ In coordination with private developers, local governments and the Oregon Department of Transportation (ODOT), shall encourage appropriate improvements to improve the convenience and safety of pedestrian and bicycle transportation throughout the County.

Rationale:

- To protect human life.

Implementation:

- The County shall study the safety of proposed bicycle and pedestrian circulation networks and stress automobile and pedestrian segregation techniques.

8. POLICY: The County shall encourage existing airports to be maintained and improved, and encourage the development of additional airports as needed.

Rationale:

- To provide citizens with an alternative transportation mode.

- To facilitate the flow of goods and services (furthers Goal 9).

Implementation:

- The County shall support the adoption of the Crater Lake Klamath ~~Falls Municipal Airport~~ Regional Airport Master Plan and provisions.

9. POLICY: The County shall avoid new road alignments, whenever reasonably feasible, that divide farm lands into uneconomic farm units.

Rationale:

- To preserve agricultural land for agricultural uses (furthers Goal 3). Implementation:
- The County shall cooperate with State Highway Department when planning roads to enforce this policy.

10. POLICY: Height and use of structures within the approach and departure zones designated for the Crater Lake Klamath ~~Falls Municipal Airport~~ Regional Airport ~~in the l976 Airport Master Plan shall be limited (Arnold Thompson Associates, Inc., Master Plan, Klamath Falls Municipal Airport, April, l976); specifically:~~

A. The height of all structures within the airport approach and departure zones shall be limited.

B. All residential and heavy-use (i.e., uses where large numbers of people congregate) land uses within the airport approach safety zones shall be restricted or prohibited.

C. Uses which would create interference with or hazards to aviation shall be prohibited.

Rationale:

- To avoid hazardous obstructions and other uses within flight paths.
- To avoid conflicts between present and future airport uses and the development of land surrounding the airport.

Implementation:

- The land use plan designates approach and departure zones for the airport in accordance with the Airport Master Plan.
- The Land Development Code includes an overlay zone restricting the height and use of structures within these areas.

11. POLICY: A safe, convenient and economic transportation system, adequate to serve anticipated growth, shall be developed that will minimize adverse social, economic and environmental impacts and costs of the transportation systems.

Rationale:

- To assure adequate access to all areas of the County.
- To assure that development does not overburden roads or bring about excessive costs to the County or individuals.

Implementation:

- A review process shall be established to assure that adequate roadway improvements and transportation systems exist or are planned before development proposals are approved.

12. POLICY: The County shall establish protection zones (clear zones) for all State-owned airports.

Rationale:

- To protect the health, safety and welfare of the people in the areas adjacent to the State-owned airports.

Implementation:

- Protection zones (clear zones) have been drawn for the Chiloquin Airport as indication in the "Site Study and Airport Master Plan" for the Chiloquin Airport.
- Protection zones (clear zones) have been drawn for the landing strips located at Beaver Marsh, Crescent Lake and Malin. The clear zones are the same size as those used at Chiloquin since only light aircraft can utilize these fields.

13. POLICY: The adopted Klamath County Transportation System Plan is a special-function Plan concerned with Goal 12 requirements, and containing a number of Goals and Objectives regarding various components of the County's transportation system in unincorporated areas. The Transportation System Plan, as amended and adopted in 2021, shall be applied where appropriate; policies shall be considered to be mandatory actions which are ultimately binding on the County.

Rationale:

- The Klamath County Transportation System Plan serves as the master plan for how the County's transportation system in unincorporated areas will develop.
- To enhance the safety of the transportation system and balance the needs of agricultural, visitor, residential, bicycle, pedestrian, and freight travel to and from rural areas.

Implementation:

- Land use and subdivision ordinance regulations will be adopted that are consistent with the goals, objectives, and standards provided in the Transportation System Plan to protect transportation facilities, corridors, and sites for their identified function.

…

GOAL 13: ENERGY CONSERVATION

…

1. POLICY: The County shall encourage the use of renewable and efficient energy sources in residential, commercial, and industrial development as well as energy-efficient forms of transportation.

…

3. POLICY: New developments and neighborhoods that are large enough to support neighborhood-serving land uses (e.g., neighborhood shopping centers, schools, parks) ~~may be created~~ shall be encouraged to include such uses to reduce the need for long-distance trips.

ATTACHMENT B: LAND DEVELOPMENT CODE AMENDMENT RECOMMENDATIONS

The following modifications implement the updated TSP. Recommended changes are in an adoption-ready format; text that is recommended to be added is shown as underlined, and text recommended to be removed is shown ~~struck out~~.

Chapter 20 Review Procedures

Article 20 Basic Provisions

20.040 – Conditions of Approval

A. General Authorization to Impose Conditions of Approval.

In approving any type of development application, the Review Body is authorized to impose such conditions as may be necessary to assure compliance with the applicable provisions of this code, the Comprehensive Plan, the Urban Area Transportation System Plan, the state Transportation Planning Rule, or other requirements of law. Any conditions attached to approvals will be directly related to the impacts of the proposed use or development and will be roughly proportional in both extent and amount to the anticipated impacts of the proposed use or development.

1. In the case of transportation impacts, conditions needed to meet operations and safety standards and provide the necessary right-of- way and improvements to develop the future planned transportation system may be imposed. Conditions of approval that may apply include but are not limited to:

    a. Crossover and/or reciprocal easement agreements for all adjoining parcels to facilitate future access between parcels.

    b. Access for new developments that have proposed access points that do not meet the designated access spacing policy and/or have the ability to align with opposing access driveways.

    c. Right-of-way dedications for future planned roadway improvements.

    d. Half-street improvements along site frontages that do not have full-buildout improvements in place at the time of development.

    e. Construction of off-site improvements, including those related to bicycle and pedestrian facilities, to mitigate impacts resulting from development that relate to capacity deficiencies and public safety or necessary to upgrade public facilities to County standards.

    f. Improvements such as paving; curbing; installation of or contribution to traffic signals; and constructions of sidewalks, bikeways, accessways, multi-use paths, or streets that serve the proposed use.

Chapter 70 Public Works Department Development Standards

Article 70 Basic Provisions

70.030 – Improvement Procedures

The improvements required by this chapter shall conform to the requirements of this code, the Department of Public Works Standard Drawings, incorporated into this code by reference as Appendix A, as it may be revised, and other improvement standards adopted by the County and shall be in accordance with the following procedures:

A. Construction work shall not be commenced until all required plans, profiles and specifications have been reviewed and approved, and a permit issued by the Director of Public Works and appropriate State agencies. As required by the Director of Public Works, plans, profiles and specifications shall be submitted to the Director of Public Works prior to final development approval;

Article 71 Vehicular and Non-vehicular Access and Circulation

71.020 – Access Standards

A. Vehicular Access - Vehicular access shall be provided to all lots or parcels from a dedicated street. Developments fronting on an arterial or collector street or road may be required to provide a frontage or service road.

B. Director of Public Works Approval - Access to property fronting upon a county or public road shall be subject to the approval of the Director of Public Works.

C. Oregon Department of Transportation (ODOT) Approval - Access to property fronting upon a state highway shall be subject to the permits issued by ODOT.

D. Rural County Road Access Management – ~~Minimum Centerline Spacing Standards~~ Except as provided in Section (F), all new development and redevelopment shall meet the access spacing standards

~~Functional Class~~	~~System Spacing~~	~~Minimum Spacing~~	~~Corner Clearance~~
~~Rural Major Arterial~~	~~1 mile~~	~~1,000 feet~~	~~1,000 feet~~
~~Rural Minor Arterial~~	~~1 mile~~	~~500 feet~~	~~600 feet~~
~~Rural Major Collector~~	~~1,320 feet~~	~~250 feet~~	~~100 feet~~
~~Rural Minor Collector~~	~~1,320 feet~~	~~250 feet~~	~~50 feet~~
~~Rural Local Street~~	~~200-400 feet~~	~~75 feet~~	~~25 feet~~

Functional Class	System Spacing	Driveway/ Access Spacing	Corner Clearance
Minor Arterial	1 mile	500 feet	600 feet
Major Collector	1,320 feet	250 feet	100 feet
Minor Collector	1,320 feet	250 feet	50 feet
Local	400 feet	75 feet	25 feet

F. Klamath County Urban Growth Area Access Spacing Standards – All new development and redevelopment shall meet the access spacing standards in Table 4-3 of the Urban Area Transportation System Plan.

G. When the site of development or redevelopment in the Urban Area has frontage on roads with different functional classifications, the site shall take access on the road with the lower functional classification.

H. The County or other agency with access permit jurisdiction may require the closing or consolidation of existing curb cuts or other vehicle access points, recording of reciprocal access easements (i.e., for shared driveways), development of a frontage street, installation of traffic control devices, and/or other mitigation as a condition of granting an access permit, to ensure the safe and efficient operation of the street and highway system. In the Klamath Falls Urban Growth Area, access to and from off-street parking areas shall not permit backing onto a public street.

71.030 – General Roadway Design Standards

A. The location, width and grade of streets shall be considered in relation to existing and planned streets, to topographical conditions, to public convenience and safety, and to the proposed use of the land to be served by the street.

B. All street improvements within public right-of-way shall be designed and constructed in accordance with the Department of Public Works ~~Standard Drawings~~ standards. ~~The drawings~~ Drawings shall be reviewed and approved by the Director of Public Works and shall include the following at a minimum:

~~A.~~1. Plan & Profile, Cross-Sections shall be drawn in ink on velum or mylar (minimum 3 millimeter), 24" X 36" "Federal Aid" sheets or the equivalent.

~~B.~~2. Scale and lettering shall be such that all information is clearly legible and shall be approved by the County Engineer.

~~C.~~3. All drawings submitted shall be dated and stamped by a registered, professional engineer licensed to practice in the State of Oregon. Include the subdivision name and tract number, developers name, and a vicinity map.

~~D.~~4. Show typical road design section.

~~E.~~5. Provide signature block for the county engineer.

6. Each Plan shall contain the following:

~~1.~~a. Existing topographic features including off right- of- way or off site features affecting road and/or drainage design.

~~2.~~b. Proposed improvements or new construction.

~~3.~~c. Proposed drainage facilities.

~~4.~~d. Property lines or lot lines intersecting road right-of-way.

~~5.~~e. Existing utilities.

~~6.~~f. Road names, north arrow, scale, horizontal curve information and stationing.

7. Each Profile shall contain the following:

~~1.~~a. Existing ground profile at centerline using same horizontal scale as the plan.

~~2.~~b. Proposed finished grade and subgrade at centerline. Show vertical curve information and stationing for finished grade. Profile stationing shall correspond with plan stationing.

~~3.~~c. Proposed drainage facilities with flow line elevations.

8. Each Cross-Section shall contain the following:

~~1.~~a. Existing ground Cross-Section the full right-of-way width.

~~2.~~b. On minimum 50 foot stationing, at curve points, at intersecting drainages, at intersecting streets and at any other locations critical for design purposes.

~~3.~~c. On a 1 inch grid.

~~4.~~d. The proposed finished grade and subgrade cross-section at the corresponding station with existing ground elevation at centerline and proposed centerline finished grade elevation.

C. The Director of Public Works may waive or allow deferral of standards street improvements, including sidewalks, roadway, bicycle lane, undergrounding or utilities, and landscaping, as applicable, where one or more of the following condition is met. Where the County agrees to defer a street improvement, it shall do so only where the property owner agrees not to remonstrate against the formation of a local improvement district in the future.

1. The standard improvement conflicts with an adopted capital improvement plan.

2. The standard improvement would create a safety hazard.

3. It is unlikely due to the developed condition of adjacent property that the subject improvement would be extended in the foreseeable future, and the improvement under consideration does not by itself significantly improve transportation operations or safety.

4 The improvement under consideration is part of an approved partition in the RCR, R-10, R-5, R-2, or R-1 zones and the proposed partition does not create any new street.

71.040 Minimum Right-of-Way Widths

Except as otherwise required by this code, the minimum width of rights-of-way for land partitions, subdivisions and other affected development shall be as follows:

A. Rural Roadways

~~A.~~1. ~~Freeways~~ Principal Arterial - In accordance with the standards and specifications of the Oregon State Highway Division;

~~B. Major Highways - 100 feet with improvements in accordance with the standards and specifications of this code;~~

~~C.~~2. Minor Arterial Street - ~~80~~ 84 feet minimum with improvements in accordance with the standards and specifications of the code;

~~D.~~3. Major Collector Street – ~~60~~ 70 feet minimum with improvements in accordance with the standards and specifications of this code;

4. Minor Collector Street – 70 feet minimum with improvements in accordance with the standards and specifications of this code;

~~E.~~5. ~~Local Street~~ Low Volume Collector - 60 feet with improvements in accordance with the standards and specifications of this code; and

6. Standard Local - 60 feet with improvements in accordance with the standards and specifications of this code; and

~~F. Cul-de-sac Street - 60 feet with improvements in accordance with the standards and specifications of this code.; and~~

7. Private Minimum Access Road ~~Streets or easements~~ - 30 feet minimum private easement ~~land partitions~~.

B. Urban Roadways

1. Major Arterial Street – 82 feet minimum with improvements in accordance with standards and specifications of this code;

2. Collector – 70 feet with improvements in accordance with the standards and specifications of this code; and

3. Local – 60 feet with improvements in accordance with the standards and specifications of this code.

4. Private Minimum Access Road – 30 feet minimum private easement

~~H.~~C. Recommended Design Standards:

Rural Area Road Design Standards							
Functional Classification	Minor Arterial	Major Collector	Minor Collector	Low Volume Collector	Standard Local		
					Community Local	Rural Local <5acres	Rural Local => 5 acres
Travel Lane Width, ft	12	11	11	10	10	10	10
Paved Shoulder, ft	6	5	4	2	2	-	-
Gravel Shoulder, ft	-	-	-	4	4	6	3
Turn Lane Width, ft	12	12	12	-	-	-	-
Bike Lane, ft	-	-	-	-	-	-	-
Parking, ft	-	-	-	-	-	-	-

Sidewalk	-	-	-	-	-	-	-
Multi-Use Path, ft	12	12	10	-	-	-	-
Number of Lanes	2-5	2-3	2-3	2	2	-	-
Right of way Width	84-96	70-82	70-82	60	60	60	60

Urban Area Road Design Standards			
Functional Classification	Major Arterial	Collector	Local
Travel Lane Width, ft	11	11	10
Paved Shoulder, ft	-	-	-
Gravel Shoulder, ft	-	-	-
Turn Lane Width, ft	14	12	-
Bike Lane, ft	6	6	-
Parking, ft	-	-	8
Sidewalk	7	5	5
Multi-Use Path, ft	12	10	-
Number of Lanes	4-5	3	2
Right of way Width	82-98	70	60

1. The Director of Public Works may approve a reduction to the minimum right-of-way width where a 10-foot public utility easement is provided adjoining all lot lines abutting a street, or as otherwise required by the Director.
2. A multi-use path is optional for Rural Area street improvements unless required as a condition of approval where pedestrian connectivity is necessary.
3. A multi-use path is not required for Urban Area street improvements where sidewalks are installed.

~~Vehicle Lane Widths: (minimum widths)~~	~~Truck Route = 12 feet~~ ~~Arterial = 12 feet~~ ~~Collector = 12 feet~~ ~~Local = 10-11 feet~~ ~~Turn Lane = 10-14 feet~~
~~On-Street Parking:~~	~~Not Applicable~~

~~Bicycle Lanes: (minimum widths)~~	~~Arterials = 4' paved shoulder~~ ~~Collectors = 4' paved shoulder~~ ~~Curb & Gutter Streets = 5'~~ ~~Standard Bike Lane = 6'~~
~~Sidewalks:~~	~~Shoulder or separated pathway~~
~~Landscape Strips:~~	~~Optional~~
~~Medians:~~	~~Optional~~
~~Neighborhood Traffic Management / Traffic Calming:~~	~~None~~
~~Turn Lanes:~~	~~When warranted~~
~~Maximum Grade:~~	~~Arterials = 6%~~ ~~Collectors = 6% Local Streets = 10%~~

71.050 Improvement in the Klamath Falls Urban Area

The following roadway improvements shall be required for all developments within the Klamath Falls Urban Growth Area unless otherwise specified, and shall be provided at the expense of the developer:

A. All roads that are functionally classified as arterials or collectors shall provide sidewalks and bikeways (e.g. bicycle lanes) on both sides of the roadway, except as determined otherwise by the Director of Public Works as provided in Section 71.030.C. All roads shall be designed and constructed in accordance with Public Works ~~Standard Drawings~~ Standards in Appendix A.

B. ~~As required~~ Unless otherwise approved by the Director of Public Works, all rights-of-way shall be cleared between the catch points of cuts or fills of the approved cross section. The entire right-or-way shall be cleared of all flammable brush, limbs, logs and stumps outside of slope limits to the full width of the right-of-way;

C. When necessary for public convenience and safety, the review body may require pedestrian ways to permit access to cul-de-sacs, to pass through oddly shaped or unusually long blocks, or to provide access to schools, parks or other public or private areas. Pedestrian ways shall be no less than 10 feet in width with an improved surface no less than 8 feet in width, and shall be dedicated to the public.

D. All ~~development~~ roads that are functionally classified as Urban Roadways shall be constructed in conformance with the recommended design standards as provided in Section 71.040.B and 71.040.C, except as determined otherwise by the Director of Public Works, as provided in Section 71.030.C. All roads shall be designed and constructed in accordance with ~~the Department of~~ Public Works Standards ~~Drawings, as may be revised~~ in Appendix A.

E. Where through-access is not required per Article 71.150, a private minimum access road may serve a maximum of three dwelling units. The access shall conform with Appendix D of the Oregon Fire Code for all geometric elements and have a minimum paved width of 20 feet within a 30 feet (minimum) private easement common to all properties served that allows for emergency and public service vehicle use. The access shall be privately maintained with a recorded covenant that meets the requirements of the Public Works Director.

F. All roads within the Urban Area shall be paved.

LDC 71.060 - Improvements Outside The Klamath Falls Urban Area

The following roadway improvements shall be required for all developments outside the Klamath Falls Urban Growth Boundary unless otherwise specified in an appropriate Urban Growth Area Management Agreement, and shall be provided at the expense of the developer:

~~A. A minimum of roadways not less than 32 feet in width improved with gravel and drainage facilities as required by the Director of Public Works shall be provided where the average lot size of the development is not greater than 5 acres;~~

~~B. A minimum of roadways not less than 32 feet with a traveled way of 22 feet improved gravel and drainage facilities as required by the Director of Public Works shall be provided where the average lot size of the development is greater than 5 acres;~~

A. All roads that are functionally classified as Rural Roadways shall be constructed in conformance with the recommended design standards as provided in Section 71.040.A and 71.040.C, except as determined otherwise by the Director of Public Works, as provided in Section 71.030.C. All roads shall be designed and constructed in accordance with Public Works Standards.

B. Unless otherwise approved by the Board of County Commissioners, newly constructed local roads within Rural Areas shall be User Maintained Roads.

C. User Maintained Roads can be in public right-of-way or private easements with a recorded private maintenance covenant (or equivalent) that meets County requirements.

1. User Maintained Public Road. User maintained public roads shall comply with requirements for Standard Local Roads pursuant to 71.040.A.6 and 71.040.C.

2. Private Roads.

a. Private Roads may serve a maximum of 50 dwelling units or a maximum of average daily traffic (ADT) of 500 vehicles-per-day (VPR), whichever is greater,

b. Shall comply with recommended design standards as provided in Section 71.040.A and 71.040.C, except as determined otherwise by the Director of Public Works pursuant to Section 71.030.C.

c. Shall be designed and constructed in accordance with Public Works Standards.

e. Be located in a private easement common to all properties served that allows for emergency and public service vehicle use.

f. Meets the circulation requirements of Article 71.150.

g. Easement width shall be 60-feet minimum and must accommodate all cut and fill slopes, ditches, turnouts, and turnarounds.

i. Additional dwelling units or equivalent traffic generation may be allowed for master-planned developments where roads are interconnected, and community fire protection is coordinated and approved by the appropriate fire protection agency.

3. Private Minimum Access

a. In rural residential, commercial, or industrial zones, private Minimum Access roads may serve a maximum of five dwelling units or a maximum average daily traffic (ADT) of 50 vehicles-per-day (VPD), whichever is greater.

b. In all other rural zones, private Minimum Access roads may serve up to ten dwelling units or 100 vehicles-per-day (VPD), whichever is greater.

c. Private Minimum Access roads shall:

1) Conform with Appendix D of the Oregon Fire Code for all geometric elements.

2) Have a minimum travelling width of 20 feet.

3) Be located in a private easement common to all properties served that allows for emergency and public service vehicle use.

4) Meet the circulation requirements of Article 71.150.

f. Easement width shall accommodate all cut and fill slopes, ditches, turnouts, and turnarounds and shall be as follows.

1) 30 feet minimum width for roads providing access to up to three parcels.

2) 40 feet minimum width for roads providing access to four or more parcels.

g. A Private Minimum Access may be required to dedicate additional easement width where future division of the remaining parcels and/or adjacent property with legal access could affect the required easement width.

~~C.~~D. ~~As required~~ Unless otherwise approved by the Director of Public Works, all rights-of-way shall be cleared between the catch points of cuts or fills of the approved cross section. The entire right-of-way shall be cleared of all flammable brush, limbs, logs and stumps outside of slope limits to the full width of the right-of-way;

~~D.~~F. All development shall be designed and constructed in accordance with the Department of Public Works Standards ~~Drawings~~, as may be revised.

LDC 71.070 Roadway Alignment

A. The Director of Public Works shall review and approve all roadway alignments;

B. All streets and roads shall be in alignment with existing streets and roads by continuation of the existing centerline or by connection with curves, unless otherwise specified by the Director of Public Works;

C. The intersections of offset alignments shall be spaced not less than 100 feet apart, unless otherwise specified by the Director of Public Works.

D. Centerline radii of curves shall not be less than:

1. 300 feet on major or arterial streets or roads;

2. 200 feet on collector streets or roads; and

3. 100 feet on all other streets or roads.

LDC 71.080 Roadway Grades ~~and Curves~~

A. The Director of Public Works shall review and approve all roadway vertical alignments.

~~A.~~B. Roadway grades shall not exceed:

1. 6 percent on major or arterial streets or roads;

2. 10 percent on all other streets or roads.

~~B. Centerline radii of curves shall not be less than:~~

~~1. 300 feet on major or arterial streets or roads;~~

~~2. 200 feet on collector streets or roads;~~

~~3. 100 feet on all other streets or roads.~~

LDC 71.100 Cul-De-Sacs and Dead-end Streets

A. Cul-de-Sacs

~~A. The length of a cul-de-sac shall be measured along the centerline of the roadway from the right-of-way line to the farthest point of the cul-de-sac.~~

~~B. All cul-de-sacs shall terminate with a circular turn around having a right-of-way not less than 50 feet radius and an improved turnaround of not less than 40 feet radius, unless otherwise specified in this code.~~

1. Minimum right-of-way diameter of a cul-de-sac shall be 110 feet in an urban area with sidewalk and public utility easement placed on adjacent private property, and 106 feet in rural areas with paved surfacing. Minimum diameter surfacing across bulb of a cul-de-sac shall be 96 feet; distance may be taken to face of curb in urban areas. Surface material shall match typical road surfacing.

2. Right-of-way for cul-de-sacs with gravel surfacing in rural areas may be reduced where utilities are placed under gravel surfacing

~~C.~~3. In urban areas a road ending in a cul-de-sac or a loop road shall not exceed 500 feet in length or serve more than 18 dwelling units. The review body may require a pedestrian way or bikeway between the cul-de-sac and adjacent streets in order to enhance accessibility and connectivity. Pedestrian ways shall be no less than 10 feet in width with an improved surface no less than 8 feet in width, and shall be dedicated to the public.

~~D.~~4. In rural areas, ~~a cul-de-sac shall not exceed 700 feet in length, unless otherwise specified in this code.~~ a publicly maintained road ending in a cul-de-sac or loop road shall not be longer than 700 feet measured from centerline of intersecting through street to the furthest point of the road.

~~E.~~5. The maximum ~~grade~~ cross-slope of a cul-de-sac turnaround shall not exceed 3% in any direction.

6. The Director of Public Works may require an emergency vehicle access to connect a cul-de-sac at its terminus with adjacent roads.

7. Temporary cul-de-sacs are allowed pursuant to the following standards.

a. Temporary cul-de-sacs may be within a temporary easement; bulb area lying outside of the straight-street right-of-way may also be within a temporary easement pending forward extension of the street.

b. Temporary cul-de-sacs area allowed to be paved with crushed rock sufficient to support a fire apparatus weighing 60,000 pounds.

c. Temporary cul-de-sac easements are extinguished, when applicable, through the right-of-way vacation process in accordance with ORS 368.

B. Dead-end Street

1. Whenever a permanent or temporary dead-end street serves, or will serve, more than six lots, or extends more than 150 feet from the centerline of the accessing street to the farthest extent of the surfaced travels, a cul-de-sac or hammerhead turn-around shall be provided at the termination of the road that complies with Appendix D of the Oregon Fire Code.

2. Where the extension exceeds 750 feet, the applicant shall provide approval from the appropriate fire protection agency that the road meets the minimum fire district requirements to provide emergency services to the property.

LDC 71.110 Existing Streets

A. Whenever existing streets, whether adjacent to or within the development, are of inadequate right-of-way width or cross-section per this code, then the additional necessary right-of-way shall be dedicated and improvements constructed to meet the standard with the following exceptions for construction: ~~within the development boundary shall be dedicated at the time of the land division.~~

1. Existing urban streets already constructed with curb, gutter, and sidewalk that do not conform to current cross-section standards.

2. Infill residential developments in urban areas of not more than four dwelling units.

3. Existing rural streets constructed with required lane width and a minimum of 2 feet of shoulder (paved or unpaved), unless there are known issues with safety or development generates enough traffic to warrant mitigation.

B. Right-of-way dedication shall be completed prior to approval of the final plat regardless if street improvements are required.

C. Where a "shoulder" section in existing urban area is required to be improved, widening to urban standard with curb, gutter, and sidewalk along property frontage is allowed.

D. Exceptions do not apply where a Transportation Impact Analysis recommends improvements to an existing street, or when safety issues are identified by the Director of Public Works.

E. Improvements shall be completed prior to approval of the final plat or assurance given in accordance with Article 15, except where the Director of Public Works allows the developer to participate in public road improvements through a deferred improvement agreement under the following conditions.

1. The project is identified on a Capital Improvement Plan and more efficiently constructed with the larger project.

2. The improvements would be isolated within the street corridor and only a minor part of potential traffic on the road would be generated by the proposed development.

LDC 71.150 ~~Blocks~~ Street Circulation

~~A. The length, width and shape of blocks shall be designed with regard to providing a safe and efficient layout of building sites when considering topography, access, circulation and safety.~~

A. Proposed development will result in, or will not inhibit the development of, complete blocks bound by a network of public streets, and/or private streets constructed to County standards. Looped or dead-end streets shall only be permitted when the County Engineer determines:

1. There is no opportunity for connecting to neighboring parcels or developments; or

2. There are physical barriers, zoning regulations, legal constraints, or other applicable restrictions that prohibits the connection to road stub-outs, easements, neighboring parcel(s), public roads, or rights-of-way; and

3. The development does not result in land locking of present or future parcels.

B. Blocks shall not exceed 1,320 feet when measured from road centerline to road centerline. In the Klamath Falls Urban Growth Area, block length shall not exceed 600 feet to improve connectivity for vehicular and non-vehicular traffic.

C. New public roads shall be consistent with any adopted transportation plan applicable to the area. Private roads are not allowed on alignments shown in any adopted transportation plan applicable to the area.

D. No road shall serve more than 50 dwelling units or a maximum average daily traffic (ADT) of 500 vehicles-per-day, whichever is greater, unless the street is connected in at least two locations with another street.

1. The second access requirement may cause the construction of an off-site road connecting the development to a suitable serving street.

2. These provisions are not intended to preclude Oregon Revised Statutes addressing land locking.

LDC 71.190 Non-vehicular Access and Circulation

A. For new commercial, light industrial, and multi-family residential development, internal pedestrian circulation shall be provided through sidewalks and walkways/pathways, pursuant to the following standards:

1. Walkways shall be provided connecting building entrances with adjacent sidewalks, adjacent trails, public parks, and open space areas, if any, and to all future phases of the development as applicable ~~and streets adjoining the site~~.

2. Connections shall be direct and driveway crossings minimized. A connection is reasonably direct when it follows a route that does not deviate unnecessarily from a straight line or it does not involve a significant amount of out-of-direction travel.

3. Walkways shall be at least five-feet-wide~~, raised, include curbing, or have different paving material when crossing driveways~~. The Review Body may require six-feet-wide, or wider, concrete sidewalks in development where pedestrian traffic warrants wider sidewalks.

4. Pedestrian connections to adjoining properties shall be provided except where such a connection cannot be accommodated due to topographical constraints or where existing development on adjacent sites preclude connections. Pedestrian connections shall connect the on site circulation system to existing or proposed streets, walkways, and driveways that abut the property. Where adjacent properties are undeveloped or have potential for redevelopment, streets, accessways and walkways on site shall be laid out or stubbed to allow for extension to the adjoining property.

5. Except as required for crosswalks pursuant to 71.190.A.6, where a walkway abuts a driveway or street it shall be raised and curbed along the edge of the driveway or street. Alternatively, the Review Body may approve a walkway abutting a driveway at the same grade if the walkway is physically separated from all vehicle-maneuvering areas (e.g., bollards with adequate spacing between them to prevent vehicles from entering the walkway).

6. Where a walkway crosses a parking area or driveway it shall be clearly marked with contrasting paving materials (e.g., pavers, light-color concrete inlay between asphalt, or similar contrasting material).

B. Transit Access. New commercial and light industrial buildings within 600 feet of an existing or planned transit facility~~,~~ as identified in the Urban Area TSP or other applicable plan adopted by the County, shall provide for pedestrian access to transit through the following measures:

1. Either locate buildings within 20 feet of the transit facility, a transit street, or an intersecting street or provide a pedestrian plaza at the transit facility or a street intersection;

2. Provide a reasonably direct pedestrian connection between the transit facility and building entrances on the site;

3. Provide a transit passenger landing pad accessible to disabled persons;

4. Provide an easement or dedication for a passenger shelter if requested by the transit provider; and

5. Provide lighting at the transit facility.

LDC 71.200 Traffic Impact Study

A. A traffic impact study shall be developed by a Professional Engineer under any of the following conditions:

1. The proposed development generates 50 or more peak-hour trips or 500 or more daily trips.

2. An access spacing exception is required for the site access driveway(s) and the development generates 25 or more peak-hour trips or 250 or more daily trips.

3. The proposed development is expected to impact intersections that are currently operating at the upper limits of the acceptable range of level of service during the peak operating hour.

4. The proposed development is expected to significantly impact adjacent roadways and intersections that have previously been identified as high crash locations or areas that contain a high concentration of pedestrians or bicyclists such as school zones.

5. Major construction projects anticipated to have temporary traffic impacts or cause disproportionate damage on existing infrastructure, as determined by the Public Works Director.

B. Submittal requirements: The study shall include the following minimum requirements:

1. The analysis shall include alternates other than what the developer originally submits as a proposal for access.

2. The analysis of alternate access proposals shall include:

a. Existing daily and appropriate design peak hour counts, by traffic movements, at intersections that would be affected by traffic generated by the development.

b. Projected daily and appropriate design peak hour volumes for these same intersections and at the proposed access points after completion of the development. If the development is to be constructed in phases, projected traffic volumes at the completion of each phase shall be determined.

c. Trip Generation shall be calculated using the Institute of Transportation Engineers' manual "Trip Generation – 5th Edition" or other, more current, and/or applicable information.

d. A determination of the need for a traffic signal based on warrants in the "Manual on Uniform Traffic Control Devices".

3. The internal circulation of parking lots must be analyzed to the extent that it can be determined whether the points of access will operate properly.

4. An analysis of the impacts to neighboring driveway access points and adjacent streets affected by the proposed new development driveways.

5. A discussion of bike and pedestrian use and the availability of transit to serve the development.

6. The recommendations made in the report shall be specific and based on a minimum level of service when the development has been completed. As an example, if a traffic signal is recommended, the recommendations should include the type of traffic signal control and what movements should be signalized. If a storage lane for right turns or left turns is needed, the recommendations should include the amount of storage needed. If several intersections are involved for signalization, and an interconnected system is considered, specific analysis should be made concerning progression of traffic between intersections.

C. Review criteria and procedure. The following criteria should be used in reviewing a transportation impact analysis:

1. The road system is designed to meet the projected traffic demand at full buildout.

2. Proposed driveways do not adversely affect the functional characteristics of the surrounding roadways.

3. Adequate intersection and stopping sight distance is available at all driveways.

4. Proposed driveways meet the County's access spacing standard or sufficient justification is provided to allow a deviation from the spacing standard.

5. Opportunities for providing joint or crossover access have been pursued.

6. The site does not rely upon the surrounding roadway network for internal circulation.

7. The road system provides adequate access to buildings for residents, visitors, deliveries, emergency vehicles, and garbage collection.

8. A pedestrian path system is provided that links buildings with parking areas, entrances to the development, open space, recreational facilities, and other community facilities in accordance with the state Transportation Planning Rule.

D. Conditions of Approval. As part of every land use action, Klamath County and the City of Klamath Falls, and ODOT (if access to a state roadway is proposed) will be required to identify conditions of approval needed to meet operations and safety standards and provide the necessary right-of- way and improvements to develop the future planned transportation system. Conditions of approval that may apply include:

1. Crossover easement agreements for all adjoining parcels to facilitate future access between parcels.
2. Conditional access permits for new developments which have proposed access points that do not meet the designated access spacing policy and/or have the ability to align with opposing access driveways.
3. Right-of-way dedications for future planned roadway improvements.
4. Half-street improvements along site frontages that do not have full- buildout improvements in place at the time of development.
5. Construction of off-site improvements, including those related to bicycle and pedestrian facilities, to mitigate impacts resulting from development that relate to capacity deficiencies and public safety or necessary to upgrade public facilities to County standards.
6. Improvements such as paving; curbing; installation of or contribution to traffic signals; and constructions of sidewalks, bikeways, accessways, multi-use paths, or streets that serve the proposed use.

Klamath County Land Development Appendix A

Klamath County Department of Public Works Standards ~~Drawings~~

[Update Standard Drawing Number 100: Collector Street]

[No changes to Standard Drawing Number 101: Local Street For Use in Urban Areas or as Required]

[Update Standard Drawing Number 102: Residential Paved Street For Use in Rural Areas or as Required]

[Update Standard Drawing Number 104: Gravel Road Outside Urban Growth Boundary and Less Than Five Acre Lots]

[Update Standard Drawing Number 114: Graded Road Outside Urban Growth Boundary and Greater Than Five Acre Lots]

[No changes to Standard Drawing Numbers 115 through 211]